Shasta County Department of Resource Management
Planning Division

FOUNTAIN WIND PROJECT
ENVIRONMENTAL IMPACT REPORT

DRAFT ENVIRONMENTAL IMPACT REPORT

July 2020

Use Permit No. UP 16-007
State Clearinghouse No. 2019012029

Prepared for:
Department of Resource Management
Planning Division

Prepared by:
Environmental Science Associates

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ESA

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EXECUTIVE SUMMARY

ES.1 Introduction

This Draft Environmental Impact Report (EIR) analyzes the direct, indirect, and cumulative environmental impacts of the proposed Fountain Wind Project (Project) and alternatives to the Project that have been identified by the staff of the Shasta County (County) Department of Resource Management, Planning Division, and recommends mitigation measures to avoid or reduce the environmental effects of the Project that have been identified as "significant" for purposes of the California Environmental Quality Act (CEQA) and its implementing regulations, the CEQA Guidelines. This Draft EIR is an informational document whose purpose is not to recommend either approval or denial of the Project, but rather is to inform agency decision makers and the public of the potential environmental consequences of the Project. Because environmental considerations are but one of multiple factors that may be taken into consideration when an agency is deciding whether to approve a proposal, the County will consider factors outside the scope of CEQA when it decides whether to approve the Project.

ES.2 Project Summary

ES.2.1 Project Overview

The Fountain Wind Project is a renewable wind energy generation development proposed on approximately 4,464 acres in unincorporated Shasta County (Project Site). Access to the Project Site would be provided regionally and locally by Interstate 5 (I-5), approximately 35 miles to the west of the Project Site; State Route (SR) 139, approximately 60 miles to the east of the Project Site; SR 299; Moose Camp Road; and three existing, gated logging roads that would be used to enter the Project Site.

Within the Project Site, the applicant has applied for a Use Permit (UP 16-007) to construct, operate, maintain, and ultimately decommission up to 72 wind turbines and associated transformers together with associated infrastructure and ancillary facilities. Each turbine would be no more than 679 feet tall, as measured from ground level to vertical blade tip (total tip height), and would have a generating capacity of 3 to 5.7 megawatts (MW). The Project would have a maximum total nameplate generating capacity of up to 216 MW.[1] Associated infrastructure and facilities would include: a 34.5-kilovolt (kV) overhead and underground electrical collector system to connect turbines together and to an onsite collector substation; overhead and underground fiber-

[1] "Nameplate capacity" is the amount of power that would be generated under ideal conditions. Actual output can differ from nameplate capacity for a number of reasons, including wind speeds and other weather conditions, and equipment maintenance.

optic communication lines; an onsite switching station to connect the Project to the regional grid operated by Pacific Gas and Electric Company (PG&E); a temporary construction and equipment laydown area; 14 temporary laydown areas distributed throughout the Project Site to store and stage building materials and equipment, an operation and maintenance (O&M) facility; up to four permanent meteorological (MET) towers; temporary, episodic deployment of mobile Sonic Detection and Ranging (SoDAR) or Light Detection and Ranging (LiDAR) systems within identified disturbance areas (e.g., at MET tower locations); two storage sheds; and three temporary batch plants. New access roads would be constructed within the Project Site, and existing roads would be improved. The Project would operate year-round.

ES.2.2 Project Location

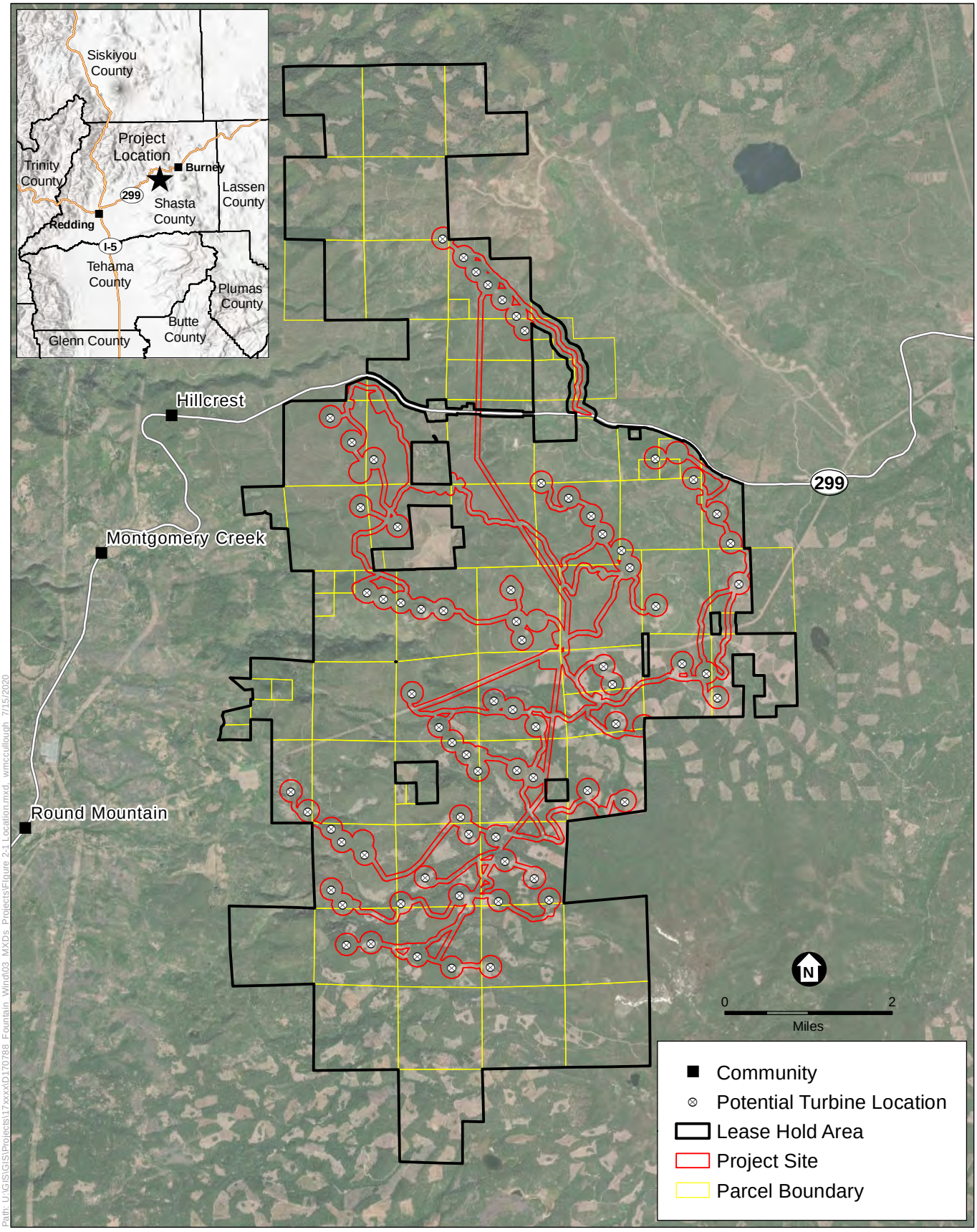
The approximately 4,464-acre Project Site is located within an approximately 29,500-acre area that comprises 76 Shasta County Assessor's parcels (APNs). The 76 APNs consist exclusively of private property operated as managed forest timberlands. The property is located approximately 1 mile west of the existing Hatchet Ridge Wind Project, 6 miles west of Burney, 35 miles northeast of Redding, immediately north and south of California State Route 299 (SR 299), and near the private recreational facility of Moose Camp[2] and other private inholdings. See **Figure ES-1**, *Project Location*. Other nearby communities include Montgomery Creek, Round Mountain, Wengler, and Big Bend. The Project Site is also within in a geographic area that is traditionally and culturally affiliated with the Pit River Tribe. Lassen National Forest lies to the southeast and Shasta-Trinity National Forest is to the north. Other surrounding lands are privately owned; many are used for timber harvesting purposes. Elevations in the area range from 3,000 to 6,000 feet.

Little Cow Creek and the south fork of Montgomery Creek cross the Project Site from east to west. Other small tributaries run through the valleys. Northern portions of the leasehold were affected by the 1992 Fountain Fire, as evidenced by burn scars. The Shasta County General Plan designates the Project Site as Timber (T); the zoning designations are Timber Production (TP) (approximately 4,457 acres) and Unclassified (U) (approximately 6 acres). Existing land uses within the Project Site consist exclusively of managed forest lands. Unpaved logging roads and transmission lines cross the Project Site.

ES.3 Purpose and Use of the Draft EIR

This Draft EIR is an informational document intended to disclose to the public and decision-makers the potential environmental impacts of the Project. This document assesses the direct, indirect and cumulative environmental impacts that could occur as a result of the Project and alternatives to the Project. All of the resource areas in the CEQA Guidelines Appendix G Checklist were studied: Aesthetics, Agriculture and Forestry Resources, Air Quality, Biological

[2] Moose Camp is an approximately 146-acre private recreational facility owned and operated by Moose Recreational Camp, Ltd., a California Non-Profit Mutual Benefit Corporation, for the benefit of its approximately 75 members and their families (Moose Recreational Camp, Ltd., 2012a, 2012b; Environmental Science Associates, 2019 [Letters P17, P23, P37, P43, P55]). In Moose Camp, 50 cabin residences are used year-round (Environmental Science Associates, 2019 [Letters P17, P23, P37, P43, P55]).



Fountain Wind Project

Figure ES-1
Project Location

Resources, Cultural Resources, Energy, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Mineral Resources, Noise, Population and Housing, Public Services, Recreation, Transportation, Tribal Cultural Resources, Utilities and Service Systems, and Wildfire. The potential for the Project to result in communications interference is also examined.

The County will rely on this Draft EIR as it may be amended in response to agency and public input received following their review of this Draft EIR, along with other information in the formal record, in deciding whether to approve, approve with modifications, or disapprove the requested application. Other agencies with trustee responsibilities or permitting authority over the Project, including but not limited to the California Department of Forestry and Fire Protection (CAL FIRE), California Department of Fish and Wildlife (CDFW), California Public Utilities Commission (CPUC), and the Regional Water Resources Control Board (RWQCB), also may rely on this document in deciding whether to approve or issue other authorizations for the Project. See Table ES-1, *Summary of Permits and Approvals*, for additional details.

ES.4 Project Objectives

The Applicant seeks to build the Fountain Wind Project to meet the following objectives:

1. Develop, construct, and operate a commercial wind energy generation facility capable of generating up to 216 MW of wind energy.
2. Interconnect to the Northern California electrical grid (NP15).[3]
3. Locate the Project in close proximity to an existing transmission line with sufficient capacity to reduce impacts and costs associated with building new transmission infrastructure.
4. Assist California in meeting the renewable energy generation targets set in Senate Bill (SB) 100.[4]
5. Create temporary and permanent jobs in Shasta County and contribute to the County's tax base.
6. Obtain entitlements to construct and operate a commercially financeable wind energy project.
7. Support landowners through diversification of revenue streams.
8. Offset approximately 128,000 metric tons of carbon dioxide emissions generated by fossil fuels.
9. Provide emissions-free energy for approximately 100,000 households.[5]

[3] The California Independent System Operator (CAISO) manages the operation of California's power grid, including the generation and transmission of electricity by PG&E and the CAISO's other member utilities. The CAISO divides the state into three regions: NP15, SP15, and ZP26. NP15 corresponds to PG&E's electric service territory (CAISO, 2008; PG&E, 2014). An existing 230 kV line crosses the Project Site south of SR 299 (CEC, 2014). The Project would interconnect to the grid along this line.

[4] SB 100 was signed into law on September 10, 2018. This bill accelerates the state's renewable energy goals, requiring 60 percent of California's electricity portfolio to come from eligible renewable sources by 2030 and that all retail electricity be carbon-free by 2045.

[5] The California Public Utilities Commission (CPUC) reported in 2018 that "California households consume electric service at an average rate of 534 kWh per month in the summer months, and 459 kWh per month in the winter months" (CPUC, 2018). If California households consume an average of 496.5 kWh per month (or 5.958 MWh per year), then the Project's generation of 605,491 MWh of electricity per year could serve an estimated 101,627 households per year.

ES.5 Proposed Discretionary Approvals

A "discretionary" approval requires an exercise of judgment or deliberation by a public agency or body in deciding whether to approve, approve with modifications, or disapprove a particular activity. **Table ES-1** summarizes the discretionary approvals and, for informational purposes, some of the key ministerial approvals that may be required for site preparation, construction, operation, maintenance, and decommissioning of the Project.

TABLE ES-1
SUMMARY OF PERMITS AND APPROVALS

Agency	Permit/Approval
Federal	
Federal Aviation Administration (FAA)	Notice of Proposed Construction or Alteration; Determination of No Hazard.*
U.S. Army Corps of Engineers (USACE)	Clean Water Act Section 404 Nationwide Permit if jurisdictional waters of the U.S. could be affected by construction or operation of the Project.
U.S. Fish and Wildlife Service (USFWS)	Section 7 or Section 10 permits may be required if the Project results in take of a species listed under the federal Endangered Species Act (FESA).
State	
California Department of Forestry and Fire Protection (CAL FIRE)	Application for timberland conversion (Pub. Res. Code §4621 et seq.); approval of a timber harvesting plan (Pub. Res. Code §4582).
State and/or Regional Water Resources Control Board (SWRCB and/or RWQCB)	Construction Stormwater General Permit; Notice of Intent to Comply with Section 402 of the Clean Water Act, SWPPP and SPCC Plan; Industrial Stormwater General Permit; Approval of O&M SWPPP and SPCC Plan. Section 401 Certification if USACE determines jurisdictional waters of the U.S. would require a Clean Water Act Section 404 permit.
California Department of Fish and Wildlife (CDFW)	Streambed Alteration Agreement (Fish & Game Code §1600 et seq.); permit authorization if "take" of endangered, threatened, or candidate species could result incidental to an otherwise lawful activity (Fish & Game Code §2081).
California Department of Transportation	Oversize load permit(s) and variances for loads with a width over 15 feet and/or length over 135 feet. Encroachment Permit for utility line crossing state right-of-way.*
California Highway Patrol	Notification of Transportation of Oversize/Overweight Loads.*
California Public Utilities Commission	Approval of construction of switching station for transfer to PG&E (i.e., General Order 131-D).
Local	
Shasta County Air Quality Management District	Authority to Construct and/or Permit to Operate as needed.
Shasta County	Use Permit.
Shasta County Department of Resource Management, Environmental Health Division	Hazardous Materials Business Plan, septic system permit, well permit.*
Shasta County Building Division	Building and grading permits.*
Shasta County Hazardous Materials Program, Certified Unified Program Agency	Hazardous Materials Business Plan and Permit for handling hazardous materials above threshold quantities (includes hazardous waste management).*
Shasta County, Public Works Department	Encroachment Permit.*

NOTE: * Typically processed as ministerial permits

ES.6 Overview of Project Impacts and Mitigation

Section 3.1 in Chapter 3, *Environmental Analysis*, includes a summary of the environmental topics that were removed from consideration and the rationale for doing so. Briefly, resources or resource considerations were not carried forward for more detailed consideration because the resource is not present in the Project Area or because the Project would not result in an impact on the resource. Sections 3.2 through 3.18 provide an overview of the setting; analyze the potential direct, indirect and cumulative impacts of the Project and alternatives; and identify mitigation measures designed to reduce potential significant impacts below established thresholds. The Project would cause no impact, a less-than-significant impact (with or without mitigation), or a significant and unavoidable impact as noted below. See Section ES.7 for a comparison of the environmental impacts of the Project with those of the alternatives.

ES.6.1 Less-than-Significant Impacts / Less-Than-Significant Impacts with Implementation of Mitigation Measures

The Project would have a less-than-significant impact, or a less-than-significant impact with the implementation of recommended mitigation measures, for specific considerations within the following resource categories:

1. Aesthetics
2. Air Quality
3. Biological Resources
4. Communications Interference
5. Cultural and Tribal Cultural Resources
6. Energy
7. Forest Resources
8. Geology and Soils
9. Greenhouse Gas Emissions
10. Hazards and Hazardous Materials
11. Hydrology and Water Quality
12. Land Use and Planning
13. Noise and Vibration
14. Public Services
15. Transportation
16. Utilities and Service Systems
17. Wildfire

ES.6.2 Significant and Unavoidable Impacts

Section 15126.2(b) of the CEQA Guidelines requires that the EIR describe any significant impacts, including those that can be mitigated but not reduced to less-than-significant levels. The Project would have a significant and unavoidable impact regarding the following resource considerations:

1. **Aesthetics**: The Project would have a significant and unavoidable impact, both at the Project-specific level and cumulatively, with regard to its effect on a scenic vista and the existing visual character or quality of public views of the site and its surroundings from publicly accessible vantage points.
2. **Air Quality**: The Project would have a significant and unavoidable impact with regard to a cumulatively considerable net increase in emissions of particulate matter less than or equal to

10 microns in diameter (PM_{10}) in a region of non-attainment for PM_{10} state ambient air quality standards. Mitigation Measure 3.3-2c (Fugitive Dust Controls) is proposed, but would not reduce the potential impact below the established threshold.

3. **Biological Resources**: The Project would have a significant and unavoidable impact with regard to potential mortality and injury to raptors as a result of collisions with wind turbines and electrical transmission lines and mortality and injury to bats, including special-status species. These significant unavoidable impacts also would be cumulatively significant and unavoidable.

4. **Cultural and Tribal Cultural Resources**: The Project would have a significant and unavoidable impact with regard to changes in the significance of a tribal cultural resource. Mitigation Measure 3.6-1 (Archaeological Research Design) and Treatment Plan and Mitigation Measure 3.6-3 (Tribal Cultural Resources Interpretive and Use Program) are proposed, but would not reduce the potential impact below the established threshold.

ES.6.3 Irreversible Impacts

Section 15126.2(c) of the CEQA Guidelines defines an irreversible impact as an impact that uses nonrenewable resources during the initial and continuing phases of the project. Irreversible impacts also can result from damage caused by environmental accidents associated with a project. Irretrievable commitments of resources are evaluated to ensure that such consumption is justified.

Buildout of the Project would commit nonrenewable resources during Project construction and ongoing utility services during Project operations. During operations, some oil, gas, and other fossil fuels and nonrenewable resources would be consumed and irreversible commitments of small quantities of nonrenewable resources would occur as a result of long-term Project operations. However, once operational, the Project would result in a substantial net benefit with respect to nonrenewable resources as a result of the amount of renewable energy that would be generated. See Section 3.10, *Greenhouse Gas Emissions*, for details.

ES.6.4 Summary of Project Impacts and Mitigation Measures

Table ES-2 summarizes the environmental impacts of the Project and recommended mitigation measures that, if adopted, would avoid or substantially reduce potential significant impacts of the Project. The analysis of each impact is provided on a resource-by-resource basis in Chapter 3.

TABLE ES-2
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Aesthetics			
Impact 3.2-1: The Project would, unless mitigated, have a substantial adverse effect on a scenic vista or substantially degrade the character or visual quality of views from publicly accessible vantage points.	Potentially significant	**Mitigation Measure 3.2-1: Project Design to Reduce Aesthetic Impacts at KOP 1** When finalizing the design for the Project, the Applicant shall site turbines to avoid placing turbines within the viewshed of KOP 1, or to reduce the visibility of turbines from KOP 1. For example, if the turbines were to be moved further downslope they would be less visible, from KOP 1. When submitting site plans to the County of Shasta to be approved, the Applicant shall demonstrate to the County that the impacts from KOP 1 have been avoided or reduced. The turbines shall be painted in accordance with manufacturer's and Federal Aviation Administration marking requirements. Commercial messages and symbols shall not be used on turbine structures. When the site plans are presented to the County for approval, the Applicant also shall present the type of turbine selected to the County so that the County may ensure that no commercial messages are used on the turbines.	Significant and unavoidable
Impact 3.2-2: The Project could damage scenic resources within a state scenic highway.	Less than significant impact	No mitigation measures are required	
Impact 3.2-3: The Project could create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area.	Less than significant impact	No mitigation measures are required	
Air Quality			
Impact 3.3-1: Construction, decommissioning, and site reclamation activities would generate pollutant emissions that could conflict or obstruct implementation of the applicable air quality plan.	Potentially significant	**Mitigation Measure 3.3-1a: Tier 4 Final Emission Standards for Off-road Construction Equipment.** The Applicant (and/or its construction contractor[s]) shall require that all diesel-fueled off-road construction equipment of more than 50 horsepower used at the Project Site during construction, decommissioning, and/or reclamation activities meet USEPA Tier 4 Final emission standards. A compliance log shall be maintained by the Applicant and made available to the Shasta County Department of Resource Management upon request. **Mitigation Measure 3.3-1b: Idling Restrictions and Fuel Use.** To ensure that idling time for on road vehicles with a gross vehicular weight rating of 10,000 pounds or greater does not exceed the five-minute limit established in Section 2485 of Title 13 California Code of Regulations, and that idling time for off-road engines does not exceed the five-minute limit established in Title 13 California Code of Regulations Section 2449(d)(3), the Applicant and/or its construction contractor(s) shall prepare and implement a written idling policy and distribute it to all equipment operators. Clear signage of these requirements shall be provided for construction workers at all access points to construction areas. The Applicant shall use CARB-certified alternative fueled (compressed natural gas [CNG], liquid propane gas [LPG], electric motors, or other CARB certified off-road technologies) engines in construction equipment where feasible.	Less than significant

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Air Quality (cont.)			
Impact 3.3-2a: Construction, decommissioning, and site activities would generate ROG emissions that could result in a cumulatively considerable net increase of ozone, for which the Project region is non-attainment of State ambient air quality standards.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.3-2b: Construction, decommissioning, and site reclamation activities would generate NO_x emissions that could result in a cumulatively considerable net increase of ozone, for which the Project region is non-attainment of State ambient air quality standards.	Potentially significant	**Mitigation Measure 3.3-2b:** Implement Mitigation Measures 3.3-1a (Tier 4 Final Emission Standards for Off-road Construction Equipment) and 3.3-1b (Idling Restrictions and Fuel Use).	Less than significant
Impact 3.3-2c: Construction, decommissioning, and site reclamation activities would generate PM_{10} emissions that would result in a cumulatively considerable net increase of PM_{10}, which the Project region is non-attainment of State ambient air quality standards.	Potentially significant	**Mitigation Measure 3.3-2c: Fugitive Dust Controls.** The following AQMD Standard Mitigation Measures for fugitive dust shall be implemented during the construction, decommissioning, and reclamation phases by the Applicant and/or its contractor(s): • Options to open burning of vegetative material on the Project Site shall be used by the Applicant unless otherwise deemed infeasible by the AQMD. Examples of suitable options are chipping, mulching, and conversion to biomass fuel. • The Applicant shall be responsible for ensuring that all adequate dust control measures are implemented in a timely and effective manner during all phases of Project development and construction. • All material excavated, stockpiled, or graded should be sufficiently watered to prevent fugitive dust from leaving property boundaries and causing a public nuisance or a violation of an ambient air standard. Watering should occur at least twice daily with complete site coverage, preferably in the mid-morning and after work is completed each day. • All areas (including unpaved roads) with vehicle traffic should be watered periodically or have dust palliatives applied for stabilization of dust emissions. • All onsite vehicles should be limited to a speed of 15 miles per hour on unpaved roads. • All land clearing, grading, earth moving, and excavation activities on the Project Site shall be suspended when winds are expected to exceed 20 miles per hour. • All inactive portions of the development site should be seeded and watered until suitable grass cover is established.	Significant and unavoidable

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Air Quality (cont.)			
Impact 3.3-2c (cont.)		• The Applicant shall be responsible for applying (according to manufacturer 's specifications) nontoxic soil stabilizers to all inactive construction areas (previously graded areas that remain inactive for 96 hours) in accordance with the Shasta County Grading Ordinance. • All trucks hauling dirt, sand, soil, or other loose material should be covered or should maintain at least 2 feet of freeboard (i.e., minimum vertical distance between top of the load and top of the trailer) in accordance with the requirements of California Vehicle Code Section 23114. This provision shall be enforced by local law enforcement agencies. • All material transported off site shall be either sufficiently watered or securely covered to prevent a public nuisance. • During initial grading, earth moving, or site preparation, the Applicant shall be required to construct a paved (or dust palliative-treated) apron, at least 100 feet in length, onto the Project Site from the adjacent paved Highway 299. • Paved streets adjacent to the development site should be swept or washed at the end of each day to remove excessive accumulations of silt and/or mud that may have accumulated as a result of activities on the development site. • Adjacent paved streets shall be swept at the end of each day if substantial volumes of soil materials have been carried onto adjacent public paved roads from the Project Site. • Wheel washers shall be installed where project vehicles and/or equipment enter and/or exit onto paved streets from unpaved roads. Vehicles and/or equipment shall be washed prior to each trip. • Prior to final occupancy, the applicant shall reestablish ground cover on the construction site through seeding and watering in accordance with the Shasta County Grading Ordinance.	
Impact 3.3-2d: Construction, decommissioning, and site reclamation activities would not result in cumulatively considerable net increases of criteria pollutants in other air district jurisdictions.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.3-3: Operation of the Project would generate pollutant emissions that would not result in a cumulatively considerable net increase of criteria pollutants, which the Project region is non-attainment of State ambient air quality standards.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.3-4: Project activities would generate emissions of toxic air contaminants, potentially exposing sensitive receptors to harmful pollutant concentrations.	Less than significant	No mitigation measures are required	Less than significant

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Air Quality (cont.)			
Impact 3.3-5: Project construction, decommissioning, site reclamation, and operation would not create objectionable odors adversely affecting a substantial number of people.	Less than significant	No mitigation measures are required	Less than significant
Biological Resources			
Impact 3.4-1: Construction of the Project could, unless mitigated, cause a significant impact to special- status plant species.	Potentially Significant	**Mitigation Measure 3.4-1: Avoid and Minimize Construction Impacts on Special-Status Plants** To prevent adverse impacts to special- status plants, the Project Applicant shall implement the following measures if construction activities are to occur in the area not yet surveyed, or if vegetation removal and ground disturbing construction activities have not been completed within 5 years of the completion of rare plant surveys: a) A qualified biologist shall conduct a pre-construction survey for special-status plant species with the potential to occur within the unsurveyed area, or other areas if 5 years have passed since completion of rare plant surveys; or as otherwise approved by CDFW. The survey shall follow the procedures outlined in the CDFW (2018) rare plant survey protocol. b) If special-status plants are found to be present, plant populations shall be avoided using an appropriate (e.g., 20-foot or greater) buffer for the subject population during construction. The buffer shall be staked, roped, and/or fenced off so as to be readily identifiable by construction workers as a buffer area to be avoided. c) Where special-status plant avoidance is not feasible, the applicant shall mitigate for the loss of plants through the implementation of the following: A qualified ecologist shall develop and implement a restoration and mitigation plan according to CDFW guidelines and in coordination with CDFW. At a minimum, the plan shall include collection of reproductive structures or plant salvage from affected plants, a full description of microhabitat conditions necessary for each affected species, seed germination requirements, restoration techniques for temporarily disturbed occurrences, assessments of potential transplant and enhancement sites, success and performance criteria (e.g., greater than 1:1 replacement of individual plants or the population area), include a minimum 3-year monitoring program, as well as measures to ensure long-term sustainability such as weeding or supplemental water. d) Survey results shall be provided to the Shasta County Department of Resource Management, Planning Division and CDFW at least 14 days in advance of the initiation of construction activities within the area(s) surveyed. The Shasta County Department of Resource Management, Planning Division shall, in coordination with CDFW, determine whether or not the survey(s) were conducted in accordance with CDFW plant survey protocol and measures b) and/or c) are to be implemented. Construction shall not begin in the surveyed area until the Shasta County Department of Resource Management, Planning Division has confirmed that the survey(s) were conducted in accordance with the protocol and, if necessary, that measures 3.4-1b and/or 3.4-1c have been implemented.	Less than significant

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Biological Resources (cont.)			
Impact 3.4-2: Construction of the Project could, unless mitigated, cause a significant impact on nesting bald and golden eagles.	Potentially significant	**Mitigation Measure 3.4-2: Avoid and minimize construction-related impacts to nesting eagles (January 1 to August 31).** To prevent adverse impacts to nesting eagles, the Project Applicant shall implement the following measures if construction activities are to occur during the nesting season: a) Conduct terrestrial preconstruction eagle nesting surveys of known previously active nest sites to determine whether eagles are actively nesting or maintaining territories within 2 miles of the Project construction boundary. Surveys will be designed and carried out by a qualified biologist with experience in the natural history and nesting behavior of eagles, following USFWS guidelines. Terrestrial surveys will include all suitable eagle nesting habitat within a 2-mile buffer surrounding the Project construction boundary, as accessible, and subsequent observations at known nests to assess territory occupancy and nesting activity by adult eagles. b) Results of preconstruction eagle nesting surveys will be reported to the Shasta County Department of Resource Management, Planning Division, USFWS, and CDFW by August 31 of the year in which the survey was conducted. The Shasta County Department of Resource Management, Planning Division shall, in coordination with resource agencies, determine whether or not the survey(s) were conducted in accordance with appropriate protocols and measures c) is to be implemented. Construction shall not begin in the surveyed area until the Shasta County Department of Resource Management, Planning Division has confirmed that the survey(s) were conducted in accordance with appropriate protocols and, if necessary, that measure 3.4-2c has been implemented. c) If surveys document active eagle nests within the 2-mile survey buffer, the Project Applicant will coordinate with the County, USFWS and CDFW to define and implement recommended protective measures. Typical measures for working within 2 miles of eagle nests are to establish construction buffers (e.g., with flagging, rope, signage, or other similar barriers) in accordance with USFWS recommendations (National Bald Eagle Management Guidelines, 2007; Golden Eagle, 2013) for specific activities (e.g., vehicular traffic, construction work, etc.); and may be adjusted downward based on site-specific conditions following coordination with the USFWS Migratory Bird Program and CDFW.	Less than significant
Impact 3.4-3: Operation of the Project could, unless mitigated, result in significant adverse impacts to or direct mortality of bald and golden eagles.	Potentially significant.	**Mitigation Measure 3.4-3a: Avoid and minimize operational impacts on avian and bat species.** The Project Applicant will avoid and minimize operational impacts on eagles, other raptors, other birds and bats by enacting the following mitigation measures: a) Discourage raptor use of immediate vicinity of wind turbine generators by taking steps to reduce prey species' numbers, such as minimizing creation of prey habitat such as rock piles. b) Follow APLIC (2006, 2012) guidance for all energized Project components to minimize electrocution or collision with transmission lines.	Significant and Unavoidable.

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Biological Resources (cont.)			
Impact 3.4-3 (cont.)		c) Follow Land-Based Wind Energy Guidelines (USFWS, 2012) for turbine design and best management practices that help to minimize eagle mortality and eliminate potential raptor perches; avoid guy wires on meteorological towers where possible. d) Prior to Project construction, the Applicant will coordinate with USFWS regarding potential impacts to eagles and demonstrate the Projects' compliance with the Bald and Golden Eagle Protection Act and the USFWS Eagle Conservation Plan Guidance (2013). e) All Project staff responsible for operations will be trained in reporting avian and bat wildlife fatalities, including those of bald and golden eagles, other raptors, and bats encountered during turbine maintenance and other regular activities on site. A protocol for project staff will be developed in coordination with CDFW and the County for appropriate handling and reporting fatalities. **Mitigation Measure 3.4-3b: Monitor avian and bat mortality rates during project operations.**[6] To accurately assess operational Project impacts on avian species, including bald eagle, golden eagle, other raptors, and bats, and ensure the effectiveness of avian protection measures, the applicant will design and implement a post-construction mortality monitoring (PCMM) study. The PCMM will include the following elements: a) The duration of PCMM monitoring to assess ongoing impacts of operation will include post-construction monitoring for eagles, other raptors, and bats. The PCMM monitoring will commence immediately following the beginning of commercial operation and continue for three years following the incorporation of all planned turbines and power generation. b) PCMM studies will be designed to meet a minimum overall detection probability for bald and golden eagles of 30 percent during the first three years of full operation. Additionally, the PCMM will include a mandatory incidental monitoring and reporting program for other raptors and bats for the life of the Project. c) Searcher efficiency trials and carcass persistence trials using large raptor carcasses or an appropriate, commercially available proxy will be implemented and used to calculate overall detection probabilities of eagle carcasses. Carcasses of other birds and bats will also be collected and reported. d) Monitoring will occur over all seasons of occupancy for the species being monitored.	

[6] Mitigation measure 3.4-3b encompasses more species than just eagles. This is to avoid redundancy within the document, and the measure is referred to as a means of reducing other impacts throughout the document.

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Biological Resources (cont.)			
Impact 3.4-3 (cont.)		e) Applicant will provide an annual report of PCMM findings to the Shasta County Department of Resource Management, Planning Division, CDFW, and the USFWS. If a bald or golden eagle, other raptors or bats are detected during PCMM, and detections indicate exceedance of the following thresholds, the Applicant and relevant agencies will develop a plan to mitigate the impacts per the *Land-Based Wind Energy Guidelines* (USFWS, 2012).[7] • Bald eagle – injury or mortality to one or more bald eagles in any given year. • Golden eagle – injury or mortality to one or more golden eagles in any given year. • Other raptors – injury or mortality to six or more individuals of any sensitive raptor species in any given year, except northern goshawk. For northern goshawk, injury or mortality to two or more individuals in any given year. • Bats – injury or mortality to three or more bats of a single species identified as Western Bat Working Group (WBWG) high priority (red) species (i.e., pallid bat, Townsend's bat, spotted bat, western red, or western mastiff) in any given year; or injury or mortality to six or more bats of a single species identified as WBWG medium priority (yellow) species (i.e., hoary bat or spotted bat), in any given year. The Applicant will implement minimization measures recommended by these agencies to limit mortality. Which may include operational modifications such as curtailment of turbine speed. The possible use of low-intensity ultraviolet light and ultrasonic deterrence systems to deter birds and bats from approaching rotating wind turbine blades may also be considered as warranted (AWWI, 2018). **Mitigation Measure 3.4-3c: Offset operational impacts on eagles through compensatory mitigation, if necessary.** a) If bald or golden eagle mortality occurs as a result of the Project, the Project Applicant will fund the retrofitting of electrical utility poles that pose a high risk of electrocution to eagles. Applicant will coordinate with the USFWS and follow the most current USFWS Eagle Conservation Plan Guidance (USFWS, 2013). If in coordination with USFWS an alternative compensatory mitigation measure is preferred to pole retrofitting, such alternative compensation measure (e.g., pole reframing or funding carcass removal from roadways) may be implemented.	

[7] Injury and mortality thresholds for bald eagle, golden eagle, and California spotted owl stated above were developed based on the low expectation for species mortality during project operations. For northern goshawk, this species is not listed and no California wind farm mortality has been identified in California. Because this species is unlikely to be encountered, a threshold of two individuals was adopted. For other raptors, the adopted threshold was based on the regional populations of Coopers hawk, sharp-shinned hawk, and northern harrier, which are fairly healthy. For most raptor species, mortality to migrating individuals is not anticipated. This assessment was based on focused baseline surveys of the Project area, monitoring findings from the Hatchet Ridge Wind Project, and coordination with raptor experts. For uncommon bat species with low population numbers, four WBWG high priority species are considered to have a low to moderate potential to occur and a threshold of three individuals per species was adopted based their rarity and low encounter numbers at the Hatchet Ridge Wind Project. For two WBWG medium species, a threshold of six bats was adopted based on the absence of habitat in the Project area (western mastiff bat) or the greater abundance of the species (hoary bat).

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Biological Resources (cont.)			
Impact 3.4-3 (cont.)		b) Any compensatory mitigation must occur within the same Eagle Management Unit as the Project, and must be completed within one year of any instance of documented take. c) Applicant will provide a report to the Shasta County Planning Department and USFWS documenting implementation of measures taken within one year of detection of the eagle take. d) Annually and after collection of 3 years of post-construction monitoring data, the Shasta County Department of Resource Management's will review the data and, in coordination with the Project Applicant, USFWS and CDFW, will determine which, if any, specific wind turbines generate disproportionately high levels of avian (including eagle) mortalities (based on evidence of statistically significant higher levels of mortality relative to other Project wind turbines). If specific wind turbines are found to result in disproportionately high avian mortalities based on collected data, the Project Applicant shall coordinate with the County to evaluate any feasible measures that can be implemented to reduce or avoid mortalities at those specific wind turbines. Furthermore, if mortalities involve eagles, the County will consider additional measures, including but not limited to carcass removal from roadways or funding for the acquisition of conservation easements on habitat that would provide nesting, foraging, or roosting bald and/or golden eagle habitat. e) If unauthorized take of a federal or state listed raptor occurs during project operation, the Project Applicant shall immediately notify the appropriate agency (CDFW and/or USFWS) by phone. The Applicant shall submit a written finding to the appropriate agency and the County within two calendar days that describes the date, time, location, species and, if possible, cause of unauthorized take. The Applicant shall notify the County within three calendar days of the receipt of any USFWS and/or CDFW required or recommended actions resulting from the unauthorized take, including whether an incidental take permit and/or additional requirements is deemed necessary by either agency.	
Impact 3.4-4: Decommissioning of the Project could result in adverse impacts to nesting bald and golden eagles.	Potentially significant	**Mitigation Measure 3.4-4:** Implement Mitigation Measure 3.4-2 (Avoid and minimize construction-related impacts to nesting eagles).	Less than significant
Impact 3.4-5: Construction, operation and decommissioning of the Project could result in adverse impacts to California spotted owls.	Less than significant	No mitigation measures are required.	Less than significant
Impact 3.4-6: Construction and decommissioning of the Project could result in adverse impacts on nesting raptors (other than goshawks).	Potentially significant	**Mitigation Measure 3.4-6: Avoid and minimize construction-related impacts on nesting raptors (March 1 to August 15)** a) Where feasible, tree and vegetation removal activities shall be avoided in potential raptor nesting habitat during the avian nesting season (March 1–August 15) during each year of construction.	Less than significant

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Biological Resources (cont.)			
Impact 3.4-6 (cont.)		b) If construction is planned to occur during the avian nesting season from March 1–August 15, pre-construction raptor nesting surveys shall be conducted by a qualified biologist to identify raptor nests within 500 feet of proposed work areas. A qualified biologist is defined as a person who is knowledgeable in the distribution, habitat, life history, and identification of Northern California birds, is familiar with the survey methods to locate and survey for active nests within the Project Site and can acquire any permits needed to survey for federally listed or state-listed birds, if such permits become necessary. c) Results of preconstruction raptor surveys will be reported to the Shasta County Department of Resource Management, Planning Division, USFWS, and CDFW by August 31 of the year in which the survey was conducted. The Shasta County Department of Resource Management, Planning Division shall, in coordination with resource agencies, determine whether or not the survey(s) were conducted in accordance with appropriate protocols and measure 3.4-6d is to be implemented. Construction shall not begin in the surveyed area until the Shasta County Department of Resource Management, Planning Division has confirmed that the survey(s) were conducted in accordance with appropriate protocols and, if necessary, that measure 3.4-6d has been implemented. d) If active raptor nests are found during pre-construction surveys, a 500-foot exclusion zone shall be established around the nest in which no work would be allowed until the young have successfully fledged or nesting activity has ceased. The determination of fledging or cessation of nesting shall be made by a qualified biologist with experience in monitoring raptor nests. Any sign of nest disturbances shall be reported to the Shasta County Department of Resource Management, CDFW and USFWS. In coordination with CDFW and/or USFWS, the County may modify the size of the exclusion zone depending on the raptor species and type of construction activity occurring near the nest.	
Impact 3.4-7: Construction and decommissioning of the Project could result in adverse impacts to nesting goshawks.	Potentially significant	**Mitigation Measure 3.4-7a:** Implement Mitigation Measure 3.4-6: Avoid and minimize construction-related impacts on nesting raptors (March 1 to August 15) **Mitigation Measure 3.4-7b: Avoid and minimize construction-related impacts to nesting goshawks (March 1 to August 15)** a) Prior to any disturbance of forest habitats that fit the nesting criteria of northern goshawks, the Applicant will conduct acoustic surveys for northern goshawk during their nesting season (March 1–August 31) following methods outlined by Woodbridge and Hargis (2006) to assure species is not nesting or using the territory for nesting. If nesting goshawks are found, the nests would be avoided with a suitable buffer distance (minimum 500 feet) in coordination with CDFW. b) Results of preconstruction goshawk surveys will be reported to the Shasta County Department of Resource Management, Planning Division and CDFW. The Shasta County Department of Resource Management, Planning Division shall, in coordination with resource agencies, determine whether or not the survey(s) were conducted in accordance with appropriate protocols. Construction shall not begin in the surveyed area until the Shasta County Department of Resource Management, Planning Division has confirmed that the survey(s) were conducted in accordance with appropriate protocols.	Less than significant

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Biological Resources (cont.)			
Impact 3.4-8: Operation of the Project could result in mortality and injury to raptors (including goshawk), as a result of collisions with wind turbines and electrical transmission lines.	Potentially significant	**Mitigation Measure 3.4-8:** Implement Mitigation Measure 3.4-3b (Monitor avian and bat mortality rates during project operations).	Significant and unavoidable
Impact 3.4-9: Operation of the proposed project could result in mortality and injury to waterfowl as a result of collisions with wind turbines and electrical transmission lines.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.4-10: Construction, operation, and decommissioning of the Project could have potential significant impacts on sandhill cranes during migratory movements in fall and spring, and could result in mortality of and injury to sandhill cranes.	Less than significant	No mitigation measures are required.	Less than significant
Impact 3.4-11: Construction and decommissioning of the Project could result in adverse impacts to nesting songbirds, potentially including special-status species.	Less than significant	No mitigation measures are required.	Less than significant
Impact 3.4-12: Site preparation and construction, operations and maintenance, and decommissioning and site restoration of the Project could result in habitat loss and water quality impacts on Pit roach, special-status amphibians and western pond turtle.	Potentially significant	**Mitigation Measure 3.4-12:** Implement Mitigation Measure 3.12-1 (Water Quality Best Management Practices during Activities in and near Water) and Mitigation Measure 3.4 16b (Avoid or Minimize Impacts to Wetlands and Other Waters)	Less than significant
Impact 3.4-13: Operation and maintenance of the Project could result in direct mortality and injury to bats, including special-status species.	Potentially significant	**Mitigation Measure 3.4-13:** Implement Mitigation Measure 3.4-3b (Monitor Avian and Bat Mortality Rates During Project Operations).	Significant and unavoidable
Impact 3.4-14: Site Preparation and Construction and Decommissioning and Site Restoration of the Project could result in temporary adverse impacts to special-status mammals.	Less than significant	No mitigation measures are required.	Less than significant

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Biological Resources (cont.)			
Impact 3.4-15: Site preparation and construction, operations and maintenance, and decommissioning and site restoration of the Project would result in adverse impacts to riparian habitat or other sensitive vegetation communities.	Potentially significant	**Mitigation Measure 3.4-15a:** To minimize the amount of riparian vegetation removed during construction. Implement Mitigation Measure 3.4-16b for wetlands (Avoid and minimize impacts to wetland and other waters). **Mitigation Measure 3.4-15b: Compensate for Impacts to Rocky Mountain Maple Riparian Scrub Habitat.** The Applicant shall implement a Reclamation and Revegetation Plan that includes detailed measures for the compensation, restoration, and/or enhancement of Rocky Mountain Maple Riparian Scrub Habitat on a per-acre basis. The standard for mitigation shall be no net loss. If restoration is selected as a method of compensatory mitigation, the Applicant shall prepare a riparian mitigation and monitoring plan as part of the Project's reclamation and revegetation plan and shall submit it to the County for review, determination of adequacy, and approval. Mitigation ratios shall be at a1:1 level. The Rocky Mountain Maple Riparian Scrub Habitat mitigation and monitoring plan shall be written by a qualified biologist and shall include the following elements, at minimum: a) goals of the plan and permitting requirements satisfied; b) Riparian habitat restoration activities and locations, including the restoration of temporarily affected riparian habitat to preconstruction conditions; c) monitoring and reporting requirements (including monitoring period), and criteria to measure mitigation success; and d) remedial measures, should mitigation efforts fall short of established targets. The County may consult with CDFW about the adequacy of the plan and may consult with other agencies, if the plan aims to fulfill multiple permitting and mitigation requirements.	Less than significant
Impact 3.4-16: Site preparation and construction, operations and maintenance, and decommissioning and site restoration of the Project could result in adverse impacts to wetlands and other waters.	Potentially significant	**Mitigation Measure 3.4-16a:** Implement Mitigation Measure 3.12-1 (Water Quality Best Management Practices during Activities in and near Water) **Mitigation Measure 3.4-16b: Avoid and Minimize Impacts to Wetlands and Other Waters.** The Applicant will avoid and minimize impacts on wetlands and other waters by implementing the following mitigation measures: a) Avoid direct and indirect impacts to wetlands and streams in final siting and design to the maximum extent feasible. b) Design stream crossings, including culverts, to pass a 100-year event without increasing average flow velocity or bed/bank scour potential. c) Monitor stream crossings in burn areas seasonally and maintain culverts and drains, since burned areas may experience sediment and debris loads that could result in clogged or blocked culverts.	Less than significant.

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Biological Resources (cont.)			
Impact 3.4-16 (cont.)		d) The Applicant shall also submit a site plan showing all aquatic resources and appropriate regulatory buffers or setbacks to Shasta County. e) The Applicant shall assign a qualified wetland scientist to mark all aquatic resources associated with the final project site plan. Temporary high visibility fencing, and signage may be used to help protect these areas. The qualified wetland scientist would also identify corresponding setbacks to aquatic resources, as required by Project permits. f) On a continuous basis, a qualified wetland scientist or biological monitor shall be assigned to visually inspect aquatic resources, and surrounding areas, for evidence of hydrologic loss in aquatic areas. g) Develop a Spill Prevention, Control, and Countermeasures (SPCC) Plan to minimize adverse impacts to wetlands. **Mitigation Measure 3.4-16c: Compensate for Impacts to Wetlands and other Waters.** The Applicant shall implement a Reclamation and Revegetation Plan that includes detailed measures for the compensation, restoration, and/or enhancement of wetlands and other waters on a wetland type per-acre basis. The standard for mitigation shall be no net loss. If restoration is selected as a method of compensatory mitigation, the Applicant shall prepare a wetland mitigation and monitoring plan as part of the Project's reclamation and revegetation plan and shall submit it to the County for review, determination of adequacy, and approval. Mitigation ratios shall be calculated following USACE wetland mitigation procedures and shall be based on the actual impact acreage of final design per as-built construction drawings and the results of the preconstruction surveys. After review and approval by the County and pertinent regulatory agencies, mitigation shall be carried out at a ratio no less than 1:1, or another ratio approved by the appropriate jurisdictional agency, whichever is higher. The wetland mitigation and monitoring plan shall be written by a qualified biologist and shall include the following elements, at minimum: a) goals of the plan and permitting requirements satisfied; b) wetland restoration activities and locations, including the restoration of temporarily affected wetlands and other waters to preconstruction conditions; c) monitoring and reporting requirements (including monitoring period), and criteria to measure mitigation success; and d) remedial measures, should mitigation efforts fall short of established targets. The County may consult with USACE about the adequacy of the plan and may consult with other agencies, if the plan aims to fulfill multiple permitting and mitigation requirements.	

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Biological Resources (cont.)			
Impact 3.4-17: Site preparation and construction, operations and maintenance, and decommissioning and site restoration of the Project would not result in adverse impacts to movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.	Less than Significant	No mitigation measures are required.	Less than significant
Impact 3.4-18: The Project could cause a cumulatively considerable contribution to a significant cumulative impact to avian and bat species from collisions with Project infrastructure.	Potential significant	No additional reasonable, feasible mitigation measures are available that, if implemented, would reduce the Project's contribution below the established level of significance.	Significant and Unavoidable
Communications Interference			
Impact 3.5-1: The Project could cause intermittent interference to or freezing of television reception at some residences in the service area of the stations that broadcast over the Project Site.	Potentially significant	**Mitigation Measure 3.5-1: Correct or mitigate conflicts with television signals.** Prior to issuance of a construction permit from the County, the Applicant shall send notifications, via certified mail or other means that documents receipt, to all property owners of residences within the service area of the stations that broadcast over the Project site notifying them of the potential for interference with "over-the-air" television signals received by antenna. The notification shall provide contact information and instructions so that recipients may file a complaint with the Shasta County Department of Resource Management, Planning Division if interference occurs. In the event that the County receives a verified complaint regarding television broadcast interference that is attributable to this Project, the Applicant will resolve receiver interference through coordination with property owners. Verification shall include a letter or report from a qualified third party supporting the conclusion that interference is attributable to the Project. The Applicant shall not be required to provide qualifying residents with better reception than they had before the construction and operation of the Project.	Less than significant
Impact 3.5-2: The Project would not interfere with existing navigational systems operated by the FAA or the U.S. military.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.5-3: None of the Project turbines would obstruct or prevent known point-to-point microwave relay station transmissions; however, interference could occur due to turbine location adjustments or currently unknown transmissions.	Potentially Significant	**Mitigation Measure 3.5-3: Correct or mitigate conflicts with microwave signals.** Prior to issuance of a construction permit from the County, the Applicant shall notify, via certified mail or other means that documents receipt, all owners of frequency-based communication stations and towers within 2 miles of the Project Site. The notification shall provide the locations of all turbines and shall provide contact information and instructions so that recipients may file a complaint with the Shasta County Department of Resource Management, Planning Division if interference occurs.	Less than significant

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Communications Interference (cont.)			
Impact 3.5-3 (cont.)		In the event that the County receives a verified complaint regarding microwave transmission interference that is attributable to this Project, the Applicant will resolve receiver interference through coordination with owners of frequency-based communication stations and towers. Verification shall include a letter or report from a qualified third party supporting the conclusion that interference is attributable to the Project. Possible actions include the Applicant being responsible for installation of high-performance antennas at nearby microwave sites, if required. The Applicant shall not be required to provide qualifying owners with better signals than they had before the construction and operation of the Project.	
Cultural and Tribal Cultural Resources			
Impact 3.6-1: The Project could cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5.	Potentially Significant	**Mitigation Measure 3.6-1: Archaeological Research Design and Treatment Plan.** Prior to receiving a County grading permit for the Project, the applicant shall: 1. Relocate Project components to a location that would not potentially impact the known historical resource. 2. If relocation is documented to the satisfaction of the County as infeasible (where "feasible" means "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors" as defined in CEQA Guidelines Section 15364) and the historical resource would potentially be impacted by the Project, design and implement an Archaeological Research Design and Treatment Plan (ARDTP). The investigation would be completed under the methods and research design outlined in an ARDTP to be prepared in accordance with the California Resources Agency's Guidelines for Archeological Research Designs (California Resources Agency, 1991). A qualified archaeologist (defined as one meeting the Secretary of the Interior's Professional Qualification Standards for archaeology) shall prepare the ARDTP in consultation with the culturally affiliated Native American tribe(s). The ARDTP shall address, at a minimum, the following: the establishment of Environmentally Sensitive Areas; treatment and recovery of important data contained within the portions of the historical resource located within and adjacent to the Project Site; construction worker cultural resources sensitivity training; compensated archaeological and Native American monitoring; inadvertent discovery protocols; and provisions for curation or reburial of recovered materials. The ARDTP shall include the specific methods that will be employed (e.g., the length and depth of excavation, the type of equipment utilized, the percent of area investigated). The ARDTP shall identify how the proposed investigation would preserve any significant historical information obtained and identify the scientific/historic research questions applicable to the resource, the data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. The results of the investigation shall be documented in a technical report that provides a full artifact catalog, analysis of items collected, results of any special studies conducted, and interpretations of the resource within a	Less than significant

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Cultural and Tribal Cultural Resources (cont.)			
Impact 3.6-1 (cont.)		regional and local context. All technical documents shall be placed on file at the North Central Information Center of the California Historical Resources Information System. The results report shall include recommendations for archaeological and Native American monitoring in Environmentally Sensitive Areas and the protocol to follow should additional cultural materials be identified during construction activities.	
Impact 3.6-2: The Project could disturb human remains, including those interred outside of formal cemeteries.	Potentially significant	**Mitigation Measure 3.6-2: Inadvertent Discovery of Human Remains.** In the event human remains are uncovered during ground-disturbing activities (including construction, operations and maintenance, and decommissioning), the Project proponent or its contractor shall immediately halt work within a 100-foot radius, contact the Shasta County Coroner to evaluate the remains within 48 hours, and follow the procedures and protocols pursuant to Section 15064.5(e)(1) of the CEQA Guidelines. Health and Safety Code Section 7050.5 requires that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code Section 5097.98. If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission (NAHC). The NAHC will then identify the person thought to be the most likely descendent of the deceased Native American. The most likely descendent will make recommendations for means of treating, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98.	Less than significant
Impact 3.6-3: The Project would cause a substantial adverse change in the significance of a tribal cultural resource.	Potentially Significant	**Mitigation Measure 3.6-3a:** Implement Mitigation Measure 3.6-1: Archeological Research Design and Treatment Plan **Mitigation Measure 3.6-3b: Coordination with the Pit River Tribe during Project Development.** Shasta County and the Applicant will facilitate a preconstruction meeting and field visit with the Pit River Tribe through the Tribe's chairperson and the Pit River Environmental Office to discuss "tribal cultural resources" as defined in Public Resources Code Section 21074 in the Project Site and identify ways to minimize impacts on these locations during construction. The site visit will focus on viewing the location of the Project facilities, describing Project construction and operation activities, and identifying potential cultural significant features. **Mitigation Measure 3.6-3c: Detailed Recordation of Features Considered Culturally Significant to the Pit River Tribe.** The Applicant shall retain a professional ethnographic consultant to undertake a detailed recordation of any locations considered important to the Pit River Tribe. The recordation will commence prior to construction and will include photographic documentation of pre- and post-construction conditions of any identified culturally sensitive location. The information gathered as a result of field, interview, and research tasks will be compiled into a report that will be transmitted to the Pit River Tribe. Detailed recordation of any ethnographic location in this manner will create a photographic and written record of the cultural resource prior to construction of the Project, resulting in partial compensation for Project impacts.	Significant and unavoidable

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Cultural and Tribal Cultural Resources (cont.)			
Impact 3.6-3 (cont.)		**Mitigation Measure 3.6-3d: Cultural Resources Monitoring Program with the Pit River Tribe during Construction.** The Applicant shall offer and provide the opportunity for cultural resource monitors from the Pit River Tribe to monitor initial ground disturbing construction activities in areas identified by the Tribe as culturally sensitive. Monitors will have the authority to ensure that cultural site(s) discovered during the archeological survey and/or inadvertent discoveries in the Project Site are avoided or that impacts on such localities are mitigated to the extent feasible, including but not limited to, avoidance or data recovery (as outlined in Mitigation Measure 3.6-1. Archaeological Research Design and Treatment Plan). The Pit River Environmental Office should coordinate with the appropriate Achumawi bands (Itsatawi and Madesi) to assign monitors. If the offer is accepted, the Applicant shall provide compensation commensurate with market rates based on the qualifications and experience of the cultural monitor(s). Prior to tendering an offer to the Tribe the Applicant shall provide a copy of the offer to the County for review, including but not limited to the proposed number of monitors to be employed, proposed construction schedule/hours during which monitors would be present on site, proposed level(s) of compensation, and other relevant details of the proposed cultural monitoring program.	
Energy			
Impact 3.7-1: Project construction, operation and maintenance, and decommissioning and site reclamation could result in the wasteful, inefficient, or unnecessary consumption or use of energy.	Less than significant	No mitigation measures are required	Less than significant
Forestry Resources			
Impact 3.8-1: The Project could result in the loss of forest land or conversion of forest land to non-forest use	Less than significant	No mitigation measures are required	Less than significant
Geology and Soils			
Impact 3.9-1: The Project could directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.9-2: The Project could directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction.	Less than significant	No mitigation measures are required	Less than significant

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Geology and Soils (cont.)			
Impact 3.9-3: The Project could directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.9-4: The Project could result in substantial soil erosion or the loss of topsoil.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.9-5: The Project could be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.9-6: The Project could be located on expansive or corrosive soil, as defined in California Building Code Section 1803.5.3, creating substantial direct or indirect risks to life or property.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.9-7: The Project could have soils incapable of adequately supporting the use of a septic tank.	Less than significant	No mitigation measures are required	Less than significant
Greenhouse Gas Emissions			
Impact 3.10-1: The Project would generate GHG emissions, directly and indirectly.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.10-2: The Project could conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions.	Less than significant	No mitigation measures are required	Less than significant
Hazards and Hazardous Materials			
Impact 3.11-1: The Project could create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials or wastes.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.11-2: The Project could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.	Less than significant	No mitigation measures are required	Less than significant

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Hazards and Hazardous Materials (cont.)			
Impact 3.11-3: During normal operation, equipment failure or an extreme event could lead to turbine failure, resulting in a potential hazard.	Potentially significant	**Mitigation Measure 3.11-3: Mandatory Setbacks.** A minimum wind turbine setback of two times the total tip height shall be maintained from the exterior Project boundaries where the Project Site is adjacent to existing parcels of record that contain an off-site residence.	Less than significant
Impact 3.11-4: During normal operation, weather conditions could lead to ice shed from turbine blades, resulting in a potential hazard.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.11-5: During normal operations, applications of certain pesticides could result in a potential hazard.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.11-6: During normal operations, alternating changes in light intensity could occur when turbine blades are rotating and result in an adverse health effect.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.11-7: The Project could impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.	Potentially significant	**Mitigation Measure 3.11-7:** Implement the Traffic Management Plan that would be required by Mitigation Measure 3.14-3.	Less than significant
Hydrology and Water Quality			
Impact 3.12-1: The Project would, unless mitigated, violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality during construction and decommissioning.	Potentially significant	**Mitigation Measure 3.12-1: Water Quality Best Management Practices during Activities in and near Water.** To avoid and/or minimize potential impacts on water quality (and jurisdictional waters) during construction- and decommissioning-related project activities that would be conducted near (i.e., within 50 feet), in, or over waterways, the project contractor shall implement the following standard construction BMPs to prevent releases of hazardous materials and to avoid other potential environmental impacts: 1. In-stream construction shall be scheduled during the summer low-flow season to minimize impacts on aquatic resources. If instream construction takes place during higher flow seasons, the following measures shall be implemented: a. Minimize mechanized equipment use below top of bank of streams; b. Perform activities in accordance with all permit conditions and best practices; and c. Have environmental monitors on-site to monitor instream construction to ensure compliance with permit conditions and best practices.	Less than significant

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Hydrology and Water Quality (cont.)			
Impact 3.12-1 (cont.)		2. All construction material, wastes, debris, sediment, rubbish, trash, etc., shall be removed from the Project Site daily during construction and decommissioning, and thoroughly at the completion of each of these phases. Debris shall be transported to an authorized upland disposal area. 3. Consistent with the Project's Hazardous Materials Business Plan (HMBP) and Spill Prevention Control and Countermeasures Plan (SPCC), construction workers shall receive training prior to construction/decommissioning and protective measures shall be implemented to prevent accidental discharges of oils, gasoline, or other hazardous materials to jurisdictional waters during fueling, cleaning, and maintenance of equipment, as outlined in the Project's HMBP. Equipment used to perform construction work on the Project Site shall be maintained in accordance with manufacturers' protocols, and, except in the case of failure or breakdown, equipment maintenance shall be performed off-site. Crews shall check heavy equipment daily for leaks; if a leak is discovered, it shall be immediately contained and use of the equipment shall be suspended until repaired. The source of the leak shall be identified, material shall be cleaned up, and the cleaning materials shall be collected and properly disposed. 4. Vehicles and equipment shall be serviced off-site, or, if on-site service is necessary, in a designated location a minimum distance of 100 feet from drainage channels and other waterways. Fueling locations shall be inspected after fueling to document that no spills have occurred. Any spills shall be cleaned up immediately.	
Impact 3.12-2: Blasting, if it occurs, could substantially degrade groundwater quality.	Potentially significant	**Mitigation Measure 3.12-2: Best Management Practices for Blasting.** All activities related to blasting shall follow Best Management Practices (BMPs) to prevent contamination of groundwater including preparing, reviewing and following an approved blasting plan; proper drilling, explosive handing and loading procedures; observing the entire blasting procedures; evaluating blasting performance; and handling and storage of blasted rock. 1) ***Blasting Plan.*** Prior to conducting the first blast on the Project Site, the Applicant shall prepare and submit a detailed blasting plan to the Shasta County Department of Resource Management and the Shasta County Sheriff's Department. The blasting plan shall contain a complete description of how explosives will be safely transported and used at the site; evacuation, security and fire prevention procedures; blasting equipment list; and procedures for notification of nearby receptors. The blasting plan shall explain how the Applicant will comply with the requirements of 30 C.F.R. §§816.61 through 816.68 regarding the use of explosives to be consistent with the technical requirements of the statute. Procedures for notification shall include, but not be limited to, the following: a. At least 30 days before initiation of blasting, the operator shall notify, in writing, all residents or owners of dwellings or other structures located within 0.5-mile of the permit area describing how to request and submit a pre-blasting survey. Notification shall include posting a written notice within the Project Site, and on the County's public website describing how to obtain and submit a pre-blasting survey.	Less than significant

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Hydrology and Water Quality (cont.)			
Impact 3.12-2 (cont.)		b. A resident or owner of a dwelling or structure within 0.5-mile of any part of the permit area may request a pre-blasting survey. This request shall be made, in writing, directly to the operator or to the regulatory authority, who shall promptly notify the operator. The operator shall promptly conduct a pre-blasting survey of the dwelling or structure and promptly prepare a written report of the survey detailing the results. c. The operator shall determine the condition of the dwelling or structure and shall document any pre-blasting damage and other physical factors that could reasonably be affected by the blasting. Structures such as pipelines, cables, transmission lines, and cisterns, wells, and other water systems warrant special attention; however, the assessment of these structures may be limited to surface conditions and other readily available data. d. Prior to finalizing the blasting plan, the County or designated operator shall consult with jurisdictional authorities tasked with protecting waters of the state and implement avoidance and minimization measures, as required by CDFW, USACE, and regional water quality (Section 401) regulatory permits prepared for the Project. Such protective measures shall be included in the blasting plan and/or incorporated by reference. 2) ***Loading practices.*** The following blast hole loading practices to minimize environmental effects shall be followed: a) Drilling logs shall be maintained by the driller and communicated directly to the blaster. The logs shall indicate depths and lengths of voids, cavities, and fault zones or other weak zones encountered as well as groundwater conditions. b) Explosive products shall be managed on-site so that they are either used in the borehole, returned to the delivery vehicle, or placed in secure containers for off-site disposal. c) Spillage around the borehole shall either be placed in the borehole or cleaned up and returned to an appropriate vehicle for handling or placement in secured containers for off-site disposal. d) Loaded explosives shall be detonated as soon as possible and shall not be left in the blast holes overnight, unless weather or other documented safety concerns reasonably dictate that detonation should be postponed. e) Loading equipment shall be cleaned in an area where wastewater can be properly contained and handled in a manner that prevents release of contaminants to the environment. f) Explosives shall be loaded to maintain good continuity in the column load to promote complete detonation. Industry accepted loading practices for priming, stemming, decking and column rise shall be attended to. 3) ***Explosive Selection.*** To reduce the potential for groundwater contamination when explosives are used, explosive products shall be selected that (a) are appropriate for site conditions and safe blast execution, and (b) have the appropriate water resistance for the site conditions present to minimize the potential for hazardous effect of the product upon groundwater.	

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Hydrology and Water Quality (cont.)			
Impact 3.12-2 (cont.)		4) **Prevention of Misfires.** Appropriate practices shall be developed and implemented to prevent misfires. 5) **Blast Rock Pile Management.** To reduce the potential for contamination, the interaction of blasted rock piles and stormwater shall be managed to prevent contamination of water supply wells or surface water.	
Impact 3.12-3: The Project could decrease groundwater supplies or interfere with groundwater recharge such that the project may impede sustainable groundwater management of the basin.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.12-4: The Project would, unless mitigated, substantially increase siltation of waterways or provide substantial additional sources of polluted runoff during construction and decommissioning.	Potentially significant	**Mitigation Measure 3.12-4:** Implement the water quality best management practices during activities in and near water that would be required by Mitigation Measure 3.12-1.	Less than significant impact
Impact 3.12-5: The Project would, unless mitigated, conflict with implementation of the Central Valley Basin Plan.	Potentially significant	**Mitigation Measure 3.12-5a.** Implement the water quality best management practices during activities in and near water that would be required by Mitigation Measure 3.12-1. **Mitigation Measure 3.12-5b:** Implement the best management practices for blasting that would be required by Mitigation Measure 3.12-2.	Less than significant impact
Noise and Vibration			
Impact 3.13-1: Operation of the Project could result in the generation of a substantial permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the Shasta County General Plan or the applicable standards of other agencies.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.13-2: Construction, decommissioning, and site reclamation of the Project could result in the generation of a substantial temporary increase in ambient noise levels on and near the Project Site in excess of standards established in the Shasta County General Plan or the applicable standards of other agencies.	Potentially Significant	**Mitigation Measure 3.13-2: Noise-Reducing Construction Practices.** The Project Applicant shall ensure that the following measures are implemented during construction, decommissioning, and site reclamation activities to avoid and minimize construction noise effects on sensitive receptors: a) Construction vehicle routes shall be located at the most distant point feasible from noise-sensitive receptors. b) All heavy trucks shall be properly maintained and equipped with noise-control (e.g., muffler) devices, in accordance with manufacturers' specifications, at each work site during Project construction, decommissioning, and site reclamation to minimize heavy truck traffic noise effects on sensitive receptors.	Less than significant

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Noise and Vibration (cont.)			
Impact 3.13-2 (cont.)		c) Haul trucks and delivery trucks shall prioritize use of the east access road, if available, over the west access road, and shall avoid use of the west access road during nighttime hours. d) Helicopter use shall be limited to a period of 2 weeks or less such that receptors are not impacted for a substantial period of time. e) Limit construction operations located within 2,500 feet of residences to daytime hours only. f) Residences within 2,000 feet of helicopter activity shall be notified of the timeline of proposed operations at least 2 weeks` prior to line stringing operations. g) Nighttime (10 p.m. to 7 a.m.) helicopter use and blasting shall be prohibited.	
Impact 3.13-3: Construction, decommissioning, and site reclamation of the Project could generate groundborne vibration.	Potentially significant	**Mitigation Measure 3.13-3: Charge Weight Limits on Blasting Activities.** The Project Applicant shall ensure that blasting contractors restrict charge weight per delay such that a performance standard of less than 0.3 in/sec PPV would result at any structures in the vicinity of the blasting area. This performance standard shall be established as a condition of contract and implemented by a licensed blasting contractor in possession of a Federal Explosives License/Permit, issued by the Bureau of Alcohol, Tobacco, and Firearm.	Less than significant
Transportation			
Impact 3.14-1: The Project could conflict with a program plan, ordinance or policy addressing the circulation system.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.14-2: The Project could conflict or be inconsistent with CEQA Guidelines Section 15064.3(b).	Less than significant	No mitigation measures are required	Less than significant
Impact 3.14-3: The Project would, unless mitigated, substantially increase safety hazards.	Potentially significant	**Mitigation Measure 3.14-3: Traffic Management Plan.** Prior to the issuance of construction or building permits and prior to the removal of materials from the Project Site during decommissioning, the Applicant shall: 1. Prepare and submit a Traffic Control Plan to Shasta County Public Works Department and the Caltrans offices for District 2, as appropriate, for approval. The Traffic Control Plan must be prepared in accordance with both the Caltrans Manual on Uniform Traffic Control Devices and Work Area Traffic Control Handbook and must include, but not be limited to, the following: a. A plan for communicating construction/decommissioning plans with Caltrans, emergency service providers, and residents located in the vicinity of the Project Site. b. An access and circulation plan for use by emergency vehicles when lane closures and/or detours are in effect. If lane closures occur, provide advance notice to local fire departments and sheriff's department to ensure that alternative evacuation and emergency routes are designed to maintain response times.	Less than significant

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Transportation (cont.)			
Impact 3.14-3 (cont.)		c. Timing of deliveries to/removals from the Project Site of heavy equipment and building materials; d. Directing vehicles, pedestrians, and bicyclists on SR 299 through the construction zone with a flag person; e. Providing detours to route vehicular traffic, bicyclists, and pedestrians around lane or shoulder closures, if they occur; f. Providing adequate parking for construction trucks, equipment, and workers in the designated staging areas within the Project Site; g. Placing temporary signage, lighting, and traffic control devices if required, including, but not limited to, appropriate signage along access routes to indicate the presence of heavy vehicles and construction/decommissioning traffic, and the placement of traffic cones to provide temporary left-turn lanes into Project driveways as needed;[8] h. Preserving access to existing ingress/egress points for all adjacent property at all times; and, i. Specifying both construction/decommissioning-related vehicle travel and oversize/overweight vehicle haul routes. 2. Obtain all necessary encroachment permits for the work within the road right-of-way or use of oversized/overweight vehicles that will utilize county maintained roads, which may require California Highway Patrol or a pilot car escort. Copies of the approved traffic plan and issued permits shall be submitted to the Shasta County Public Works Department and Caltrans. 3. Consult with the Shasta County Public Works Department and Caltrans to identify any substantial construction activities on SR 299 that may overlap with construction of the Project (e.g., Caltrans SR 299 resurfacing project from Milepost 60.0 to 67.8). Coordinate with the contractor(s) of any identified project(s) to ensure that overlapping construction activities do not cause unnecessary delays on SR 299 or preclude the ability of large vehicles to access the Project Site.	
Impact 3.14-4: The Project would, unless mitigated, result in inadequate emergency access.	Potentially Significant	**Mitigation Measure 3.14-4:** Implement the Traffic Management Plan that would be required by Mitigation Measure 3.14-3 (Traffic Management Plan).	Less than significant

[8] A left-turn lane warrant analysis was conducted for the three Project driveways, which is provided in Appendix H. The analysis found that left-turn lanes would be warranted during Project construction at all three Project driveways during the a.m. peak hour.

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Utilities and Service Systems			
Impact 3.15-1: The Project would have sufficient water supplies available to serve the Project for the reasonable and foreseeable future development during normal, dry, and multiple dry years.	Less than significant	No mitigation measures are required	Less than significant
Impact 3.15-2: The Project could result in a determination by a wastewater treatment provider that it has inadequate capacity to serve the Project's projected demand in addition to the provider's existing commitments	Less than significant	No mitigation measures are required	Less than significant
Impact 3.15-3: The Project could generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals.	Less than significant	No mitigation measures are required	Less than significant
Wildfire			
Impact 3.16-1: The Project would, unless mitigated, substantially impair an adopted emergency response plan or emergency evacuation plan.	Potentially significant	**Mitigation Measure 3.16-1a:** Implement Mitigation Measure 3.14-3 (Traffic Management Plan) **Mitigation Measure 3.16-1b: Pre-Construction Coordination with CAL FIRE** Prior to construction, the Applicant shall provide GIS files or other maps of the Project layout to CAL FIRE to facilitate aerial fire-fighting planning. The Applicant shall notify CAL FIRE of any changes to the Project layout or any maintenance that would require the use of helicopters or the use of equipment not previously identified on maps provided to CAL FIRE that could present a new, previously unidentified vertical obstacle to aerial firefighting.	Less than significant
Impact 3.16-2: The Project would, unless mitigated, exacerbate wildfire risks and expose people to pollutant concentrations or a significant risk of loss, injury or death from a wildfire or the uncontrolled spread of a wildfire.	Potentially significant	**Mitigation Measure 3.16-2a: Fire Safety.** The Applicant and/or its contractors shall prepare and implement a Project-specific Fire Prevention Plan (FPP) to prevent an exacerbation of wildfire risk during both the Project construction and operation and maintenance phases. Prior to construction, the Applicant shall contact and consult with the Shasta Trinity Unit of CAL FIRE and the Shasta County Fire Department to determine the appropriate amounts of fire equipment to be carried on the vehicles and appropriate prevention measures to be taken. The Applicant shall submit verification of its consultation with the appropriate fire departments to Shasta County. The Applicant shall submit a draft FPP to the Shasta County Project Manager for approval when the building permit application is submitted. The County shall have an opportunity to make comments on and revisions to the FPP, which the Applicant shall incorporate into a revised FPP for approval. The Applicant shall make the approved FPP available to all construction crew members prior to construction of the Project. The FPP shall list fire safety measures including fire prevention and extinguishment procedures, as well as specific emergency response and evacuation measures that would be followed during emergency situations; examples are listed	Less than significant

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Wildfire (cont.)			
Impact 3.16-2 (cont.)		below. The FPP also shall provide fire-related rules for smoking, storage and parking areas, usage of spark arrestors on construction equipment, and fire-suppression tools and equipment. The FPP shall include or require, but not be limited to, the following: • Prior to construction, the Project applicant shall designate primary and alternate Fire Coordinators such that a Fire Coordinator is present at all times during Project construction. The Fire Coordinator shall be responsible for ensuring that crews have sufficient fire suppression equipment, communication equipment, shall lead and coordinate fire patrols, ensure that the required clearances are followed onsite, and ensure that all crew members receive training on the FPP and its components. • For vehicles within control of the contractor, the contractor shall require vehicle drivers to conduct a visual inspection of the vehicle for potential sparking risks prior to operation of the vehicle. This inspection should include, but not be limited to a check of tire pressure and an inspection for chains or other vehicle components that could drag while driving. For subcontractors or vendors where vehicles are not within the control of the contractor, the contractor or Applicant shall develop a standard brochure to send to vendors that shall provide educational materials about fire risks associated with vehicles and shall provide an inspection checklist. • The Applicant and/or its contractors shall have water tanks, water trucks, or portable water backpacks (where space or access for a water truck or water tank is limited) sited/available in the study area for fire protection. • During construction of the Project the Applicant and/or its contractors shall implement ongoing fire patrols during construction hours and for 1 hour after the end of daily construction and hotwork. • All construction crews and inspectors shall be provided with radio and/or cellular telephone access that is operational within the Project Site to allow communications with other vehicles and construction crews. All fires shall be reported immediately upon detection. • Require that all internal combustion engines, stationary and mobile, be equipped with spark arresters in good working order. • Require that light trucks and cars with factory-installed mufflers be used only on roads where the roadway is cleared of vegetation. • Require that equipment parking areas and small stationary engine sites are cleared of all extraneous flammable material. • Include a fire conditions monitoring program to monitor meteorological data during construction and operation. • Include a monitoring and inspection protocol for turbines and electrical infrastructure. • Include protocol for disabling re-closers and de-energizing portions of the electrical collection and transmission systems	

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Wildfire (cont.)			
Impact 3.16-2 (cont.)		• Prohibit smoking in wildland areas, with smoking limited to paved areas or areas cleared of all vegetation. • All construction vehicles shall have fire suppression equipment. • The Applicant shall ensure that all construction workers receive training on the implementation of the FPP including how to conduct a fire patrol, proper use of fire-fighting equipment and procedures to be followed in the event of a fire, vegetation clearance and equipment usage requirements, turbine, and electrical equipment inspections. • As construction may occur simultaneously at several locations, each construction site shall be equipped with fire extinguishers and fire-fighting equipment sufficient to extinguish small fires. • The Applicant shall enforce a requirement that construction personnel park any vehicles within roads, road shoulders, graveled areas, and/or cleared areas (i.e., away from dry vegetation) wherever such surfaces are present at the construction site. • The Applicant and its contractor shall cease all non-emergency work during Red Flag Warning events. • The Applicant shall coordinate the finalization of road improvements (i.e. frequency of grading and vegetation clearance) with CAL FIRE and other emergency responders to ensure that sufficient ingress and egress exists onsite. • Prior to the initiation of construction, a designated inspector from the County shall inspect the Project Site to ensure that sufficient fire suppression equipment is present onsite, that the required vegetation clearances have been cleared, that a crew member training program has been created, that construction vehicles are equipped with fire suppression equipment, that spark arrestors are installed on construction equipment, that a fire conditions monitoring program has been developed, that a monitoring and inspection protocol has been developed, that a disabling and re-closing protocol has been developed, and that CAL FIRE was appropriately consulted regarding road improvements and ingress and egress. • During construction, the Applicant shall submit a weekly FPP compliance report that demonstrates the following: fire patrols have been conducted following construction, any new construction workers have received training on the implementation of the FPP, that non-emergency work is being halted appropriately during Red Flag Warnings, and that sufficient fire suppression equipment is present onsite. Successful implementation of Mitigation Measure 3.16-2a (Fire Safety) would be demonstrated by the development of an FPP in consultation with local fire authorities which is documented and submitted to Shasta County for review, any revisions, and final approval. Additionally, successful implementation of Mitigation Measure 3.16-2a would require that the Applicant and its contractor comply with all components of the FPP, that ignition from Project construction activities is promptly reported to the fire department(s) with jurisdiction, and that when it is safe to do so, any Project-caused ignition is suppressed immediately.	

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Wildfire (cont.)			
Impact 3.16-2 (cont.)		**Mitigation Measure 3.16-2b: Nacelle Fire Risk Reduction.** Turbines shall be equipped with fire detection and prevention technology compatible with the manufacturer's operating requirements and will be maintained in good working order throughout the life of the Project. Turbines with electrical equipment in the nacelle shall have safety devices to detect electrical arc and smoke that use the best available technology for fire detection and suppression within turbines. The turbine design shall include the following components: 1. Early fire detection and warning systems; 2. Automatic switch-off and complete disconnection from the power supply system; and 3. Automatic fire extinguishing systems in the nacelle of each wind turbine. 4. Additionally, turbines shall include lightning protection equipment such as grounding equipment, and a lightning measurement system. Should any of these devices report an out-of-range condition, the device shall command a shutdown of the turbine and disengage it from the electrical collection system, and send a notice through the SCADA. The entire turbine shall be protected by current-limiting switchgear installed at the base of the tower. In the event of a lightning strike, an electrical inspection shall be conducted on the affected turbine to identify and address any damage to the turbine or electrical system that could result in subsequent fire risk. **Mitigation Measure 3.16-2c: Emergency Response Plan.** Prior to the submission of the building permit application, the Applicant shall prepare an emergency response plan to be reviewed and approved by Shasta County Planning, CAL FIRE, and the Shasta County Fire Department. Following approval of the plan, the Applicant and/or its contractors shall implement the requirements in the plan during all phases of construction and operation, as applicable. The emergency response plan shall describe the likely types of potential accidents or emergencies involving fire that could occur during both construction and operation, and shall include response protocols for each scenario. The plan shall include key contact information and a description of key processes, in the event of an emergency in order to alert relevant responders of the emergency, and how to control the emergency. The plan shall include crew member training in response, suppression, and evacuation. The training shall be coordinated by the designated Fire Coordinators. Prior to construction, the Applicant shall submit to the County a compliance report demonstrating that all crew members have been trained. As new construction crews or operation workers are brought onsite, the Applicant shall submit additional compliance reports demonstrating that they have been received training on the emergency response plan.	

TABLE ES-2 (CONTINUED)
SUMMARY OF IMPACTS AND MITIGATION MEASURES

Environmental Impact	Levels of Significance Before Mitigation	Mitigation Measures	Level of Significance after Mitigation
Wildfire (cont.)			
Impact 3.16-3: The Project would require the installation and maintenance of Project-related infrastructure (such as roads and power lines) that may exacerbate fire risk, and the installation and maintenance of fire suppression infrastructure (such as vegetation clearances and emergency water sources) that may result in temporary or ongoing impacts to the environment.	Less than significant	No mitigation measures are required	
Impact 3.16-4: The Project would, unless mitigated, expose people or structures to significant risks, including adverse water quality effects or downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.	Potentially Significant	**Mitigation Measure 3.16-4:** Implement the Fire Safety measures that would be required by Mitigation Measure 3.16-2a (Fire Safety); implement the Nacelle Fire Risk Reduction measures that would be required by Mitigation Measure 3.16-2b; and implement the Emergency Response Plan that would be required by Mitigation Measure 3.16-2c.	Less than significant

ES.7 Overview of Alternatives to the Project

CEQA requires a lead agency to analyze a reasonable range of alternatives to the project that could feasibly attain the basic objectives of the project while substantially reducing or eliminating significant environmental effects. CEQA also requires an EIR to evaluate a "no project" alternative to allow decision-makers to compare impacts of approving a project with the impacts of not approving it. The alternatives development process, alternatives eliminated from further consideration, and alternatives considered in the EIR are described in greater detail in Chapter 2, *Description of Project and Alternatives*.

ES.7.1 Alternatives Eliminated from Further Consideration

Alternatives may be eliminated from detailed consideration in an EIR if they fail to meet most of the project objectives, are infeasible, or do not avoid or substantially reduce any significant environmental effects (CEQA Guidelines §15126.6[c]). Alternatives that are remote or speculative, or the effects of which cannot be reasonably predicted, also do not need to be considered (CEQA Guidelines §15126[f][2]). The following potential alternatives were eliminated from further consideration in the EIR because they failed to meet most of the Project objectives, were infeasible, or did not avoid or substantially reduce any significant environmental effects:

1. **Off-site Alternatives:** The County initially considered a variety of potential off-site alternatives, including replacing the current proposal with an off-shore wind facility or with an on-shore facility far from the proposed site. See Section 2.5.2.1, *Off-site Alternatives*.
2. **Repowering Alternative:** The County initially considered a repowering alternative focused on one or more existing wind facilities, potentially including the Dillon, Tule Wind, Phoenix Wind, Manzana Wind, Mountain View III, and/or Shiloh projects. See Section 2.5.2.2, *Repowering Alternative*.
3. **Alternative Technologies:** The County initially considered alternative technologies, including hydroelectric power, cogeneration, and solar. See Section 2.5.2.3, *Alternative Technologies*.
4. **Alternative Approaches:** The County initially considered alternative approaches, including conservation and demand side management, other distributed energy resources, and improving the efficiency of existing energy infrastructure. See Section 2.5.2.4, *Alternative Approaches.*

ES.7.2 Alternatives Considered in the EIR

The reasonable range of alternatives analyzed in this Draft EIR is summarized below. Three alternatives to the Project are considered in detail. These alternatives were selected for more detailed consideration through the screening process described in greater detail in Section 2.5.1, *Alternatives Development and Screening.*

E.7.2.1 No Project Alternative

Under the No Project Alternative, Use Permit No. UP 16-007 would not be issued and the proposed Project would not be developed. None of the proposed wind turbines or associated transformers, associated infrastructure, or ancillary facilities would be constructed, operated and

maintained, or decommissioned on the Project Site. FAA-required safety lighting would not be installed. The proposed overhead and underground electrical collector system and communications lines would not be developed; and the onsite collector substation, switching station, and operation and maintenance (O&M) facility would not be constructed. Foundations would not be excavated, laydown areas would not be cleared, no new access roads would be constructed, and no existing roads would be improved. No groundwater well, water storage tank, or septic system would be installed onsite, and no construction-related or other refuse would be removed from the site. No electric power would be needed at the Project site, or delivered to the regional grid from the Project site. Existing stormwater drainage patterns on the site would not be affected. No materials delivery-related or other construction trucks, equipment, or additional vehicle trips would be made to, from, or within the site relative to baseline conditions. None of the proposed up to 400 construction workers and none of the up to 12 full-time employees would travel to or be employed on the Project Site; decommissioning and site restoration phase workers similarly would not be present. Instead, it is assumed that the land within the Project boundary would continue to be managed for timber production. See Section 2.5.3.1, *No Project Alternative*.

E.7.2.2 Alternative 1: South of SR 299

Under Alternative 1, the Project would be constructed, operated and maintained, and ultimately decommissioned as proposed south of SR 299, and none of the up to seven turbines proposed to the north of SR 299 (turbine numbers A01 through A07) or related infrastructure would be developed. The Alternative 1 Site would consist of the approximately 4,086 acres located south of SR 299, while the approximately 378 acres of the Project Site located north of SR 299 would continue to be managed for timber production. Each of Alternative 1's up to 65 turbines could be up to 679 feet above ground level at the top of the blade (the same as the Project) and would have a generating capacity of 3 to 5.7 MW (also the same as the Project). Overall, Alternative 1 would have a total nameplate generating capacity of up to 195 MW.

Scoping comments suggested that the County consider a reduced-Project alternative (i.e., one with fewer turbines and/or a more concentrated placement of turbines) and a modified Project alternative that would relocate the proposed turbines to the south relative to the existing proposal. Alternative 1 responds to these suggestions. Relative to the screening criteria outlined in Section 2.5.1, *Alternatives Development and Screening*, the County preliminarily has determined that Alternative 1 would be reasonable and feasible even if it would impede to some degree the attainment of the Project objectives relating to generating capacity, carbon dioxide emissions offset, and the number of households that could be served with clean energy if the Project were approved. Alternative 1 has been designed to avoid all Project impacts north of SR 299 and to lessen any significant effects of the Project to aesthetics, avian and other wildlife species and to Tribal Cultural Resources, including to birds traditionally important to the Pit River culture (e.g., eagles, eagle nests, and osprey) and audible and physical disruption of an area identified by Native Americans as culturally significant. See Section 2.5.3.2, *Alternative 1, South of SR 299*.

E.7.2.3 Alternative 2: Increased Setbacks

Under Alternative 2, proposed setbacks would be increased relative to the Project to preclude turbine construction within three times the height of the turbine (i.e., within 2,037 feet) of a residential property line and within 1.5 times the height of the turbine (i.e., within 1,018.5 feet) of State Route 299, any other publicly-maintained public highway or street, and of Supan Road or Terry Mill Road. These setback distances would be among the most protective of public health and safety in the State based on a comparison of setback requirements included in county ordinances in California for large wind projects as compiled by WINDExchange, a resource of the Wind Energy Technologies Office of the U.S. Department of Energy (DOE, 2020). Implementation of these setbacks would preclude construction of proposed turbines M03, D05, and B01 based on the residential property line setback, and would preclude turbine KO2 based on the roadway setback. Related infrastructure and work areas for these turbines (including temporary turbine construction areas, access roads and crane roads) would not be needed. The remaining turbines, infrastructure and other improvements would be the same as proposed for the Project. Each of Alternative 2's up to 68 turbines could be up to 679 feet above ground level at the top of the blade (the same as the Project) and would have a generating capacity of 3 to 5.7 MW (also the same as the Project). Overall, Alternative 2 would have a total nameplate generating capacity of up to 204 MW.

Scoping comments suggested that the County consider a Project alternative that would remove turbines farther from Moose Camp, and expressed concerns about noise, vibration, and safety. Alternative 2 has been designed to respond to these suggestions. Relative to the screening criteria outlined in Section 2.5.1, *Alternatives Development and Screening*, the County preliminarily has determined that Alternative 2 would be reasonable and feasible even if it would impede to some degree the attainment of the Project objectives relating to generating capacity, carbon dioxide emissions offset, and the number of households that could be served with clean energy if the Project were approved.

E.7.2.4 Comparison of Alternatives

Draft EIR Chapter 4, *Comparison of Alternatives*, compares the potential environmental impacts of the Project to those of the No Project Alternative, Alternative 1, and Alternative 2. **Table ES-3** summarizes impacts of the Project, Alternative 1, *South of SR 299*, and Alternative 2, *Increased Setbacks*. The No Project Alternative would avoid all impacts of the Project and instead would result in the environmental benefits and consequences that reasonably would be expected to occur based on the site's current timber production-related General Plan and zoning. Pursuant to regulations implementing the California Timberland Productivity Act (Government Code §51100 et seq.; 14 Cal. Code Regs. §897[a]), there is a legal presumption that "timber harvesting is expected to and will occur on such lands." The regulations further specify that timber harvesting on such lands "shall not be presumed to have a Significant Adverse Impact on the Environment" (14 Cal. Code Regs. §898). Therefore, the No Project Alternative, including anticipated timber harvesting, is not presumed to result in a significant adverse individual or cumulative effects. CAL FIRE would review any future timber harvesting proposal to evaluate any potential Project-specific, site-specific environmental impacts. Table ES-3 summarizes impacts of Alternative 1, *South of SR 299*, and Alternative 2, *Increased Setbacks*, as they compare to those of the Project.

TABLE ES-3
SUMMARY OF IMPACTS OF THE PROJECT AND ALTERNATIVES

EIR Section	Resource Area	Project	Alternative 1, South of SR 299	Alternative 2, Increased Setbacks
3.2	Aesthetics	Impact 3.2-1: The Project, in particular the form, color, movement, and nighttime lighting of the proposed turbines, would have a substantial adverse effect by substantially reducing visual character, visual quality, and the quality of scenic vistas for tourists, recreationists, or residents. While the implementation of recommended Mitigation Measure 3.2-1 would reduce the potential significance of impacts, impacts would not be reduced below established thresholds of significance (Significant and Unavoidable). The Project would result in a less than significant impact relating not only to the potential to damage to scenic resources within a state scenic highway (Impact 3.2-2), but also to the potential to create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area (Impact 3.2-3). (Less than Significant Impact)	Under Alternative 1, the up-to-seven turbines north of SR 99 (turbine numbers A01 through A07) would not be constructed, resulting in incrementally fewer obstructions in the visual landscape and incrementally fewer safety lights. Depending on the specific viewing location, this alternative could reduce aesthetic impacts; however, from certain locations, clustering of turbines south of SR 299 could reduce the coherence between the Hatchet Ridge project and the proposed Project, creating an appearance of multiple separate wind energy generation projects encroaching in the foothills. Any increase or decrease in the aesthetic impacts created by Alternative 1 would not be significant. Therefore, depending on the viewing location, Alternative 1 could either slightly increase or reduce aesthetic impacts. Impacts would be substantially similar to the Project impact conclusions and mitigation requirements would remain the same. **Equal to the Project**	Under Alternative 2, proposed setbacks would be increased relative to the Project to preclude turbine construction within three times the height of the turbine (i.e., within 2,037 feet) of a residential property line and within 1.5 times the height of the turbine (i.e., within 1,018.5 feet) of State Route 299, any other publicly-maintained public highway or street, and of two private roads (Supan Road and Terry Mill Road). This would result in four of the Project turbines (M03, D05, B01 and K02) not being constructed. The resulting spacing of the turbine strings could reduce from key observation points 1, 2, and 3 the visibility and visual impact of turbines from SR 299 and regarding views from KOPs near SR 299. Although this alternative would reduce the overall visual impact of the wind energy development compared to the Project, impact conclusions and mitigation requirements would remain the same. **Less than the Project**
3.3	Air Quality	Impact 3.3-2c: Construction, decommissioning, and site reclamation activities would generate PM_{10} emissions that would result in a cumulatively considerable net increase of PM_{10}, for which the Project region is non-attainment of California Ambient Air Quality Standards (CAAQS). The implementation of recommended Mitigation Measure 3.3-2c would reduce the severity of the impact, but not below established threshold of significance. (Significant and Unavoidable) Impact 3.3-1, Impact 3.3-2b: Construction, decommissioning, and site reclamation activities would generate NO_x and other emissions that could obstruct implementation of the Northern Sacramento Valley Planning Area 2018 Plan to attain the ozone CAAQS by resulting in a violation of an ozone air quality standard, and thereby would be inconsistent with the intent of the 2018 Plan and result in a cumulatively considerable net increase in regional ozone emissions. The implementation of recommended Mitigation Measures 3.3-1a and 3.3-1b would reduce the potential significance of these impacts below established thresholds. (Less than Significant with Mitigation Incorporated) The Project would result in various less than significant impacts, including with respect to its construction, decommissioning, and site reclamation activities and the generation of ROG emissions that could result in a cumulatively considerable net increase of ozone (Impact 3.3-2a); its operation, which would generate pollutant emissions that would not result in a cumulatively considerable net increase of criteria pollutants (Impact 3.3-2d and 3.3-3); its emission of Toxic Air Contaminants (Impact 3.3-4); and its potential to create objectionable odors (Impact 3.3-5). (Less than Significant Impact)	Under Alternative 1, construction activities, including timber harvesting, would generate fewer vehicle trip and equipment emissions than the number estimated for the Project because up-to-seven fewer turbines and related infrastructure would be constructed. Similarly, the decommissioning and site reclamation phase also would generate fewer vehicle trip and equipment emissions than the amounts estimated for the Project because fewer turbines and related infrastructure would be developed and the size of the area to be reclaimed would be smaller than what was identified for the Project. Although the impacts would be reduced relative to the Project, the impact conclusions and mitigation requirements would remain the same. **Less than the Project**	Under Alternative 2, construction activities, including timber harvesting, would generate fewer vehicle trip and equipment emissions than the number estimated for the Project because up-to-four fewer turbines and related infrastructure would be constructed. Similarly, the decommissioning and site reclamation phase would generate fewer vehicle trip and equipment emissions than the amounts estimated for the Project because fewer turbines and related infrastructure would be developed and the size of the area to be reclaimed would be smaller than for the Project. Although the impacts would be reduced relative to the Project, the impact conclusions and mitigation requirements would remain the same. **Less than the Project**
3.4	Biological Resources	Operation of the Project would result in significant unavoidable Project-specific and cumulative impacts -potentially including mortality and injury- to eagles and other raptors (including goshawk) as well as to bats, including special-status bat species, via collision with power lines or operating wind turbine generators, or electrocution from energized components. See Impact 3.4-3, Impact 3.4-8, Impact 3.4-13, and Impact 3.4-18. Mitigation measures including monitoring and potential adaptive operational techniques are identified at the Project-specific level; however, even with mitigation incorporated, remaining impacts would be Significant and Unavoidable. Because no additional reasonable, feasible mitigation measures are available to address cumulative impacts that, if implemented, would reduce the Project's contribution below the established level of significance. Therefore, cumulative impacts would remain Significant and Unavoidable. Mitigation measures have been identified, the implementation of which would reduce other Project impacts below established thresholds. This is true with respect to: Impact 3.4-1 (potential construction impacts to special- status plant species within an unsurveyed 800-acre area of the Project Site), Impact 3.4-2 (construction impacts on nesting bald and golden eagles –although the likelihood of eagles nesting within the Project Site is low, construction noise and activity could result in nesting disruption or abandonment if activities occur during the nesting season and active nests are located in the vicinity), Impact 3.4-4 (decommissioning impacts to nesting bald and golden eagles similar to those described for the construction in Impact 3.4-3), Impact 3.4-6 (construction and decommissioning impacts to nesting raptors other than goshawks due to noise, vegetation removal, and increased activities during the construction and decommissioning), Impact 3.4-7 (construction and decommissioning impacts to nesting goshawks due to noise, vegetation removal, and increased activities	Under Alternative 1, the Project Site would be 4,086 acres resulting in 378 acres of less Project-related disturbance and seven (9.7 percent) fewer turbines than the Project. This would result in a similar percentage reduction in bird and bat collision-related impacts. Collisions resulting in eagle, other sensitive raptors, and bats would continue to be significant and unavoidable, but likely reduced by approximately 10 percent compared to the Project. Alternative 1 would require less Rocky Mountain Maple Riparian Scrub (a sensitive vegetation community) habitat removal. An estimated 31.3 fewer acres of this habitat would be removed, resulting in a 27 percent reduction in the impact area. As for the Project, the impacts related to removal of this habitat would be less than significant with mitigation incorporated. In other respects, Alternative 1 would reduce impacts relative to the Project generally commensurate with the reduction in disturbance and number of turbines. Although the impacts would be reduced relative to the Project, the impact conclusions and mitigation requirements would remain the same. **Less than the Project**	Alternative 2 is anticipated to result in 102 fewer acres of temporary disturbance and 49 fewer acres of permanent disturbance than the Project. Alternative 2 also would result in the construction and operation of four (5.5 percent) fewer turbines than the Project. This would result in a similar percentage reduction in bird and bat collision related impacts. Collisions resulting in eagle, other sensitive raptors, and bats would continue to be significant and unavoidable, but likely reduced by approximately 5.5 percent compared to the Project. Alternative 2 would require approximately 1.7 acres less removal of Rocky Mountain Maple Riparian Scrub habitat. As for the Project, the impacts related to removal of this habitat would be less than significant with mitigation incorporated. In other respects, Alternative 2 reduce impacts relative to the Project generally commensurate with the reduction in disturbance. Although the impacts would be reduced relative to the Project, the impact conclusions and mitigation requirements would remain the same. **Less than the Project**

TABLE ES-3 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROJECT AND ALTERNATIVES

EIR Section	Resource Area	Project	Alternative 1, South of SR 299	Alternative 2, Increased Setbacks
3.4 (cont.)	Biological Resources	during the construction and decommissioning), Impact 3.4-12 (habitat loss and water quality impacts on Pit roach, special-status amphibians and western pond turtle), Impact 3.4-15 (Project impacts to riparian habitat or other sensitive vegetation communities, including removal of up to 107.2 acres of sensitive Rocky Mountain Maple Riparian Scrub habitat), and Impact 3.4-16 (Project impacts to wetlands and other waters, including permanent impacts on 2.22 acres of wetlands and 1.2 acres of other waters; temporary impacts on 1.48 acres of wetlands and 0.6 acres of other waters; and impacts resulting from the construction of or improvement to 32 stream crossings, including crossings of perennial, ephemeral, intermittent and unvegetated ditch type streams. In other respects, Project impacts would be less than significant, and no mitigation measures would be required. This is true with respect to Impact 3.4-5 (Project impacts to California spotted owls – although California spotted owl use of the area is expected to be low based on Project Site surveys and the results of Hatchet Ridge Wind post construction monitoring efforts, 995 acres of the Project Site was identified as being suitable [moderate or high quality] habitat for California spotted owls and potential nesting disruption could result from project noise, vegetation clearing, and increased activities during the construction and decommissioning phases), Impact 3.4-9 (collision-related impacts to waterfowl during operation), Impact 3.4-10 (Project impacts on sandhill cranes during migratory movements in fall and spring), Impact 3.4-11 (construction and decommissioning impacts to nesting songbirds, potentially including special-status species). Impact 3.4-14 (temporary adverse impacts to special-status mammals during site preparation and construction, and during decommissioning and site restoration activities), and Impact 3.4-17 (impacts to movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites).		
3.5	Communications Interference	The Project could cause intermittent interference to or freezing of television reception at some residences in the service area of the stations that broadcast over the Project Site (Impact 3.5-1) and or interference with point-to-point microwave relay station transmissions due to turbine location adjustments or currently unknown transmissions. The implementation of recommended Mitigation Measures 3.5-1 and 3.5-3 would reduce the potential significance of these impacts below established thresholds. (Less than Significant with Mitigation Incorporated) The Project also would result in a less-than-significant impact related to potential interfere with existing navigational systems operated by the FAA or the U.S. military (Impact 3.5-2). (Less than Significant Impact)	All of the turbine locations under Alternative 1 would be at least as far away from land mobile/public safety radio transmitter stations, earth satellite stations, AM broadcast facilities, television broadcast facilities, aircraft navigation beacons, and microwave and cellular communication facilities as for the Project. Therefore, the potential impacts on television reception (Impact 3.5-1), aircraft navigation (Impact 3.5-2), and microwave and cellular communication (Impact 3.5-3) would be the same as described for the Project. It is possible that Alternative 1 could slightly reduce the potential for unforeseen microwave communication interference because the turbines north of SR 299 would not be constructed (turbines A01, A02, and A03 are some of the closest to known microwave paths, as identified in Appendix D; however, evaluation of these turbines did not indicate interfere with the Fresnel zones of these paths, and so these turbines are not expected to cause interference. Therefore, the impact conclusions and mitigation requirements would be the same as for the Project. **Equal to the Project**	All of the turbine locations Under Alternative 2 would be at least as far away from land mobile/public safety radio transmitter stations, earth satellite stations, AM broadcast facilities, television broadcast facilities, aircraft navigation beacons, and microwave and cellular communication facilities as described for the Project. Therefore, the potential impacts on television reception (Impact 3.5-1), aircraft navigation (Impact 3.5-2), and microwave and cellular communication (Impact 3.5-3) would be the same as described for the Project, although there may be a small reduction in the potential for unforeseen microwave communication interference because several turbines would not be constructed (turbine D05 is one of the closest to known microwave paths, as identified in Appendix D; however, evaluation of this turbine did not indicate that it would interfere with the Fresnel zones of these paths and so is not expected to cause interference). Therefore, the impact conclusions and mitigation requirements would be the same as for the Project. **Equal to the Project**
3.6	Cultural and Tribal Cultural Resources	Impact 3.6-3: There is a prehistoric archaeological site in the Project Site that, for the purposes of CEQA, is considered a tribal cultural resource. In addition, Native American tribes have identified tribal cultural resources in the Project Site. The Project would cause a substantial adverse change in the significance of a tribal cultural resource if such a resource were disturbed or damaged. The implementation of recommended Mitigation Measures 3.6-1 and 3.6-3 would reduce the severity of the impact, but not below established thresholds (Significant and Unavoidable) Impact 3.6-1: The Project could cause a substantial adverse change pursuant to CEQA Guidelines Section 15064.5 due to disturbance of a historical resource, for example, during grading and excavation associated with construction, trenching, or the soil borings that would be collected to an approximately 50-foot depth to ensure that the proposed turbine foundations would be stable. The implementation of recommended Mitigation Measure 3.6-1 would reduce the potential significance below established thresholds. (Less than Significant with Mitigation Incorporated) Impact 3.6-2: Given the prehistoric archaeological sensitivity of the Project Site, the possibility of encountering human remains cannot be discounted. Project-related disturbance of human remains would be a significant impact and could occur if, for example, grading, excavation, or soil borings associated with construction of facilities and infrastructure. The implementation of recommended Mitigation Measure 3.6-2 would reduce the potential significance below established thresholds. (Less than Significant with Mitigation Incorporated).	Under Alternative 1, no turbines would be erected north of SR 299. Thus, Alternative 1 would avoid all impacts to cultural and tribal cultural resources north of SR 299, if any such resources exist. There would be an overall reduced acreage of temporary and permanent disturbance, limited to a footprint defined in a smaller area with fewer turbines compared to the Project. The prehistoric archaeological site in the Project Site would not be avoided. Although impacts would be reduced relative to the Project, the impact conclusions and mitigation requirements would remain the same. **Less than the Project**	Under Alternative 2, the prehistoric archaeological site identified within the Project Site would not be avoided; however, the overall reduction in the number of turbines would reduce both temporary (construction-related) and permanent disturbance compared to the Project. Alternative 2 would require implementation of the same protective measures and mitigation as the Project. Although impacts would be reduced relative to the Project, impact conclusions and mitigation requirements would remain the same under Alternative 2. **Less than the Project**

TABLE ES-3 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROJECT AND ALTERNATIVES

EIR Section	Resource Area	Project	Alternative 1, South of SR 299	Alternative 2, Increased Setbacks
3.7	Energy	Impact 3.7-1: Project construction, operation and maintenance, decommissioning and site reclamation could result in the wasteful, inefficient, or unnecessary consumption or use of energy associated with equipment and vehicle fuel use, although there are no unusual Project characteristics that would cause the such use to be less energy-efficient compared with other similar projects elsewhere in the state. The Project's use of electricity during operation and maintenance would be greatly offset by the generation of electricity from the Project. Accordingly, the Project's electricity demand also would not constitute a wasteful, inefficient, or unnecessary use of energy. (Less than Significant Impact) The Project would provide a new source of renewable energy supporting SB 100 and the State's energy goals, and would result in a substantial beneficial impact relating to renewable energy generation, the use of which to serve demand would be prioritized over gas-fired plants and non-renewable sources. (Beneficial Effect)	Under Alternative 1, incrementally less fuel would be required to construct, operate, maintain, and decommission a wind energy development on the Project Site because up-to-seven fewer turbines and related infrastructure would be developed. Alternative 1 would have a total nameplate generating capacity of up to 195 MW, which equates to approximately 21 MW less nameplate generating capacity as the Project. This output would more than offset the amount of electricity needed to operate and maintain Alternative 1, but would not result in as substantial a benefit as the Project due to the reduced overall capacity. Although the impacts and overall benefit of Alternative 1 would be reduced relative to the Project, the impact conclusion would remain the same, and no mitigation measures would be required. **Greater than the Project**	Alternative 2 would preclude the construction of four wind turbines, as compared to the Project, resulting in the loss of approximately 12 MW to 22.8 MW of generating capacity based on generation potential per turbine. Under Alternative 2, the number of workers and durations of construction, operation and maintenance, and decommissioning and site restoration would be incrementally less than for the Project, resulting in slightly reduced fuel use. Electricity needed during operation and maintenance would more than offset the amount of electricity needed to operate and maintain Alternative 2, but would not result in as substantial a benefit as the Project due to the reduced overall capacity. Although the impacts and overall benefit of Alternative 2 would be reduced relative to the Project, the impact conclusions would remain the same, and no mitigation measures would be required. **Greater than the Project**
3.8	Forest Resources	Impact 3.3-1: The Project would result in the temporary disturbance of up to 1,384 acres of timberland during construction and the permanent conversion of up to 713 acres of timberland to developed power generation facilities uses (i.e., to the loss of forest land or conversion of forest land to non-forest use). This would result in a reduction of less than 0.05 percent of the commercial forest lands in Shasta County. (Less than Significant Impact)	Alternative 1 would adversely affect incrementally less timberland than the Project because the approximately 378 acres of the Project Site located north of SR 299 would continue to be managed for timber production. This elimination of 378 acres of the Project Site from development would reduce temporary impacts to commercial forest lands from 1,384 acres to 1,259 acres and would reduce permanent impacts from 713 acres to 652.5 acres. Although the impacts of Alternative 1 would be slightly reduced relative to the Project, the impact conclusion would remain the same, and no mitigation measures would be required. **Less than the Project**	Alternative 2 would reduce temporary impacts to commercial forest lands from 1,384 acres to 1,282 acres relative to the Project and would reduce permanent impacts from 713 acres to 664 acres. Although the impacts of Alternative 2 would be slightly reduced relative to the Project, the impact conclusion would remain the same, and no mitigation measures would be required. **Less than the Project**
3.9	Geology and Soils	The Project would cause less-than-significant impacts to geology, soils and paleontological resources, including the risk of loss, injury, or death involving strong seismic ground shaking (Impact 3.9-1), seismic-related ground failure (including liquefaction) (Impact 3.9-2), and landslides (Impact 3.9-3). It also would result in less-than-significant impacts resulting in substantial soil erosion or the loss of topsoil (Impact 3.9-4) or unstable geologic units or soils that potentially could result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse (Impact 3.9-5). Further, the Project would cause less-than-significant impacts relating to the creation of substantial direct or indirect risks to life or property due to its location on expansive or corrosive soil (Impact 3.9-6) and the adequacy of onsite soils to support the proposed septic tank (Impact 3.9-7). (Less than Significant Impact)	Alternative 1 would result in an incremental reduction in soil disturbance (and erosion potential) relative to the Project due to the fact that up-to-seven fewer turbines and related infrastructure would be developed, and fewer onsite road miles would be needed to develop and serve Alternative 1. A septic system would be developed just as for the Project. Although the impacts of Alternative 1 would be slightly reduced relative to the Project, the impact conclusions would remain the same, and no mitigation measures would be required. **Less than the Project**	Alternative 2 would result in an incremental reduction in soil disturbance (and erosion potential) relative to the Project due to the fact that four fewer turbines and related infrastructure would be developed, and fewer onsite road miles would be needed to develop and serve Alternative 2. A septic system would be developed just as for the Project. Although the impacts of Alternative 2 would be slightly reduced relative to the Project, the impact conclusions would remain the same, and no mitigation measures would be required. **Less than the Project**
3.10	Greenhouse Gas Emissions	The Project also would have a less than significant impact relating to its potential to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. The Project would directly support the 40 percent reduction in GHG emissions by 2030 target under the 2017 Scoping Plan Update and goal of SB 100 for increasing California's procurement of electricity from renewable sources to 100 percent by 2045; Executive Order B-55-18 and the new statewide goal of achieving carbon neutrality (zero-net GHG emissions) by 2045 and maintaining net negative emissions thereafter; the 2018 Regional Transportation Plan & Sustainable Communities Strategy for the Shasta Region; and the Forest Carbon Plan. (Impact 3.10-2). The Project would result in a less-than-significant impact relating to the generation, directly and indirectly, of GHG emissions such as CO_2, methane, nitrous oxide and SF_6. After accounting for the annualized construction and decommissioning, and annual operational emissions of 809 MT CO2e per year, and the loss of carbon sequestration capacity during the Project's operational timeframe, the Project would provide a potential reduction of 225,131 MT CO2e per year. Overall, this would be a beneficial impact. (Impact 3.10-1)	Alternative 1 would generate incrementally fewer GHG emissions than the Project and would offset incrementally fewer MT CO2e per year because it would have a total nameplate generating capacity that would be approximately 21 MW less than the Project due to the reduction in the number of turbines. There would be no change relative to the Project with respect to plan consistency. The impacts of Alternative 1 would be slightly reduced relative to the Project; the beneficial effect of Alternative 1 also would be reduced. Nonetheless, the impact conclusions would remain the same, and no mitigation measures would be required. **Greater than the Project**	Alternative 2 would generate incrementally fewer GHG emissions than the Project and would offset incrementally fewer MT CO2e per year because it would have a total nameplate generating capacity that would be 12 to 22.8 MW less than the Project due to the reduction in the number of turbines. There would be no change relative to the Project with respect to plan consistency. The impacts of Alternative 2 would be slightly reduced relative to the Project; the beneficial effect of Alternative 2 also would be reduced. Nonetheless, the impact conclusions would remain the same, and no mitigation measures would be required. **Greater than the Project**

TABLE ES-3 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROJECT AND ALTERNATIVES

EIR Section	Resource Area	Project	Alternative 1, South of SR 299	Alternative 2, Increased Setbacks
3.11	Hazards and Hazardous Materials	During normal operation, equipment failure or an extreme event could lead to turbine failure, resulting in a potential hazard (Impact 3.11-3). The Project also could impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan (Impact 3.11-7). The implementation of recommended Mitigation Measure 3.11-3 and Mitigation Measure 3.11-7, respectively, would reduce the potential significance of each impact below established thresholds. (Less than Significant with Mitigation Incorporated) The Project would have a less-than-significant impact from the potential to create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials or wastes (Impact 3.11-1), reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment (Impact 3.11-2), potential hazards from ice shed from turbine blades (Impact 3.11-4), applications of certain pesticides (Impact 3.11-5), and from the alternating changes in light intensity that could occur when turbine blades are rotating (Impact 3.11-6).	Alternative 1 would result in substantially the same impact as the Project relating to equipment or turbine failure and to potential impairment of or interference with an evacuation plan. the same mitigation requirements would apply. Alternative 1 would result in incremental reductions in the less-than-significant impacts that would be caused by the Project due to the up-to-seven fewer turbines that would be constructed, operated and ultimately decommissioned. As a result, Alternative 1 would cause an incremental reduction in the amount of hazardous materials or waste, incrementally fewer turbine blades that could shed ice, and incrementally less vegetation that would be subject to pesticide application. The turbines that would be installed under Alternative 1 would cause substantially the same shadow flicker as the Project in light of the locations of potential receptors. Even with these incremental changes in impact levels, the impact conclusions would remain the same. **Less than the Project**	Alternative 2 would differ from the Project by precluding the construction, operation and maintenance of turbines within three times the height of the turbine from a residential property line and would require setbacks of 1.5 times the height of the turbine from public and private roads. Because Project turbines (M03, D05, B01 and K02 not be constructed, Alternative 2 would result in a less than significant impact relative to whether, during normal operation, equipment failure or an extreme event could lead to a turbine failure resulting in a blade throw. Under Alternative 2, Mitigation Measure 3.11-3 (Mandatory Setbacks) would not be required. Given the greater distance between proposed turbines and potential visual receptors, the less than significant impact of the Project relating to shadow flicker would be even more remote under Alternative 2. Remaining impacts would be incrementally reduced, or substantially the same as the Project. **Less than the Project**
3.12	Hydrology and Water Quality	The Project would, unless mitigated, violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality during construction and decommissioning (Impact 3.12-1); substantially degrade groundwater quality from blasting, if it occurs (Impact 3.12-2); substantially increase siltation of waterways or provide substantial additional sources of polluted runoff during construction and decommissioning (Impact 3.12-4); and conflict with implementation of the Central Valley Basin Plan (Impact 3.12-5). The implementation of recommended mitigation measures would reduce the potential significance of each of these potential significant impacts below established thresholds. (Less than Significant with Mitigation Incorporated) The Project would result in a less-than-significant impact relating to the potential to decrease groundwater supplies or interfere with groundwater recharge such that the project may impede sustainable groundwater management of the basin (Impact 3.12-3).	Alternative 1 would avoid all impacts to Little Hatchet Creek and most disturbance-related impacts to the main stem of Hatchet Creek. There would be an overall reduction in temporary and permanent disturbance due to the fewer number of turbines compared to the Project. Although the impacts of Alternative 1 would be reduced relative to the Project, the impact conclusions would remain the same, and the same mitigation measures would be required. **Less than the Project**	Given the location of the Project turbines that would not be constructed under Alternative 2, Alternative 2 would result in substantially similar impacts to hydrology and water quality as the Project. The same impact conclusions would be reached, and the same mitigation measures would be required. **Equal to the Project**
3.13	Noise and Vibration	The Project could result in the generation of a substantial temporary increase in ambient noise levels (Impact 3.13-2) on and near the Project Site in excess of standards if construction activities were required during nighttime hours or during helicopter use. The implementation of recommended Mitigation Measure 3.13-2 would reduce the potential significance of this potential significant impact below established thresholds. The Project also could result in significant impacts due to groundborne vibration from blasting. The implementation of Mitigation Measure 3.13-3 would reduce impacts to below established thresholds. (Less than Significant with Mitigation Incorporated) The Project would have a less-than-significant impact from operational noise due to the generation of a substantial permanent increase in ambient noise levels in the vicinity of the Project (Impact 3.13-1).	Because the Project turbines that would not be constructed under Alternative 1 would be located over 5,000 feet from the nearest receptor (LT-3) and, thus, would contribute substantially less to noise and vibration impacts, the impacts of Alternative 1 would be substantially the same as those of the Project, the impact conclusions would be the same, and the same mitigation requirement would apply. **Equal to the Project**	Under Alternative 2, proposed setbacks would be increased relative to the Project to preclude turbine construction within 2,037 feet of a residential property line and within 1,018.5 feet of SR 299, any other publicly-maintained public highway or street, and of Supan Road or Terry Mill Road. Implementation of these setbacks would remove turbines M03, D05, and B01 based on the residential property line setback, and would remove turbine KO2 based on the roadway setback. The effect of eliminating these turbines, in particular turbine D05, would reduce the operational and construction-related noise levels at receptor location R-4 compared to those identified for the Project. Although this impact would be incrementally reduced relative to the Project, the impact conclusions would be the same and the same mitigation requirements would apply. **Less than the Project**
3.14	Transportation	The Project would, unless mitigated, substantially increase safety hazards to the public and inhibit emergency access due to the proposed use of oversize vehicles, which could limit motorists' views on roadways and obstruct the driving area (Impact 3.14-3, Impact 3.14-4). The implementation of recommended Mitigation Measure 3.14-3 would reduce these potential significant impacts to a less-than-significant level. (Less than Significant with Mitigation Incorporated) The Project would result in less-than-significant impacts relating to its potential to conflict with a program plan, ordinance or policy addressing the circulation system (Impact 3.14-1) and its potential to conflict or be inconsistent with CEQA Guidelines Section 15064.3(b) regarding vehicle miles traveled (VMT) as the appropriate focus of transportation analyses toward reducing related GHG emissions (Impact 3.14-2).	Alternative 1 would require incrementally fewer oversized loads to deliver/remove heavy construction equipment and wind turbine components due to the reduction by up to seven turbines relative to the Project. Further, Alternative 1 would incrementally further reduce the Project's less-than-significant VMT impact because incrementally fewer vehicle trips by pick-up trucks, haul trucks, and worker vehicles due to the possibility of an incremental reduction in construction and decommissioning schedules resulting from a need for less work to occur during those timeframes. Although the impacts of Alternative 1 would be reduced relative to the Project, the impact conclusions would remain the same and the same mitigation measure would be required. **Less than the Project**	Alternative 2 would require incrementally fewer oversized loads to deliver/remove heavy construction equipment and wind turbine components due to the reduction by four turbines relative to the Project. Further, Alternative 2 would incrementally further reduce the Project's less-than-significant VMT impact because it would require fewer vehicle trips due to the possibility of an incremental reduction in construction and decommissioning schedules resulting from a need for less work to occur during those timeframes. Although the impacts of Alternative 2 would be reduced relative to the Project, the impact conclusions would remain the same and the same mitigation measure would be required. **Less than the Project**

TABLE ES-3 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROJECT AND ALTERNATIVES

EIR Section	Resource Area	Project	Alternative 1, South of SR 299	Alternative 2, Increased Setbacks
3.15	Utilities and Service Systems	The Project would have a less-than-significant impact on utilities and service systems relating to the sufficiency of water supplies available to serve the Project (Impact 3.15-1), the adequacy of a wastewater treatment provider's capacity to serve the Project's projected demand (Impact 3.15-2), and the Project's potential to generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals (Impact 3.15-3). (Less than Significant Impact*)*	Alternative 1 would incrementally reduce water, wastewater and solid waste needs commensurate with the reduction in development and ground disturbance associated with up-to-seven fewer turbines and related infrastructure such as would be needed for the collector system, access roads, and lay-down areas relative to the Project. Storm water drainage infrastructure or improvements would not be required north of SR 299. Although the impacts of Alternative 1 would be reduced relative to the Project, the impact conclusions would remain the same. **Less than the Project**	Alternative 2 would incrementally reduce water, wastewater and solid waste needs commensurate with the reduction in development and ground disturbance associated with the development of four fewer turbines and related infrastructure. Although the impacts of Alternative 2 would be reduced relative to the Project, the impact conclusions would remain the same. **Less than the Project**
3.16	Wildfire	The Project would, unless mitigated, substantially impair an adopted emergency response plan or emergency evacuation plan (Impact 3.16-1); exacerbate wildfire risks and expose Project occupants to pollutant concentrations or a significant risk of loss, injury or death from a wildfire or the uncontrolled spread of a wildfire (Impact 3.14-2); and expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes (Impact 3.16-4). The implementation of recommended Mitigation Measure 3.16-1; Mitigation Measures 3.16-2a, 3.16-2b and 3.16-2c; and Mitigation Measure 3.16-4 would reduce these potential significant impacts to a less-than-significant level. (Less than Significant with Mitigation Incorporated) The Project also would have a less-than-significant impact resulting from the proposed installation and maintenance of infrastructure such as roads, fuel breaks, emergency water sources, power lines or other utilities because such infrastructure could exacerbate fire risk (Impact 3.16-3). (Less than Significant Impact*)*	Alternative 1 would incrementally reduce the construction, operations and maintenance, and decommissioning footprint, restricting it to the portion of the Project Site that is located south of SR 299. This would have the effect of incrementally reducing the potential for a wind project-related ignition during all phases of the Project. Further, under Alternative 1, the portion of the Project Site north of SR 299 would remain under timber management and production, which could decrease the risk of wildland fire because that portion of the Project Site would be harvested and thinned, preventing excessive fuel build up in the area of the Project Site north of SR 299. Although the impacts of Alternative 1 would be reduced relative to the Project, the impact conclusions would remain the same and the same mitigation requirements would apply. **Less than the Project**	Alternative 2 would reduce the number of turbines by four relative to the Project, and so would incrementally reduce potential ignition sources from turbines, vehicles and equipment during construction, operation and decommissioning relative to the Project. Additionally, increasing the setbacks of the turbines from residential properties would provide some additional protection to surrounding communities by increasing the area between residences and the turbines in the event that a turbine fire were to occur. Although Alternative 2 would reduce impacts to wildland fire slightly, impact conclusions would be the same and the same mitigation requirements would apply. **Less than the Project**

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ES.8 Environmentally Superior Alternative

The CEQA Guidelines define the environmentally superior alternative as that alternative with the least adverse impacts to the project area and its surrounding environment. The No Project Alternative is considered the environmentally superior alternative for CEQA purposes because it would avoid all impacts of the Project. However, the No Project Alternative would fail to meet the basic objectives of the Project, including, but not limited to: locating a commercially financeable wind energy project with the capacity to provide up to 216 MW to the northern California grid (NP15) in close proximity to an existing PG&E transmission line (see Section 2.3, *Project Objectives*). Since the environmentally superior alternative is the No Project Alternative, the EIR also must identify an environmentally superior alternative from among the other alternatives.

Determining an environmentally superior alternative can be difficult because of the many factors that must be balanced. For example, Alternative 2 could be preferred because, relative to the Project, it would further remove wind project infrastructure from residential property lines and from all roads, not just public ones. Slightly fewer roads and less below-ground and above-ground infrastructure would be constructed, operated and maintained, and decommissioned and removed from the Project Site. Similarly, Project could be preferred because, relative to either Alternative 1 or Alternative 2, it would generate the greatest amount of renewable energy, and so would offset the most metric tons of carbon dioxide emissions generated by fossil fuels and provide greater assistance to the State toward meeting the renewable energy generation targets set in SB 100. Additional information received in or developed during the agency and public review period for the Draft EIR or during the Project approval process that could affect the balancing of the respective benefits and consequences of the alternatives. Accordingly, it would be premature to designate an Environmentally Superior Alternative at this stage. An Environmentally Superior Alternative will be identified in the Final EIR.

ES.9 Areas of Controversy

Any of the environmental issues considered during scoping or in this Draft EIR could become an issue of controversy. Preliminarily, the County has identified areas of controversy as including the issues and questions raised in agency and public comments received during scoping; all comments received during the scoping period are included in the Project Scoping Report, which is included as Appendix J to this Draft EIR. Issues identified as potential areas of controversy relate to: Aesthetics, Forestry Resources, Air Quality, Biological Resources, Communications Interference, Cultural and Tribal Cultural Resources, Economic and Social Impacts, Energy, Geology and Soils, Greenhouse Gas Emissions and Climate Change, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Noise and Vibration, Public Health, Public Services, Recreation, Transportation, Utilities and Service Systems, and Wildfire. More specifically, scoping input expressed potential controversy particularly regarding daytime and nighttime views of the Project, and potential impacts on avian species and all manner of flora and fauna; headwaters, surface waters, and other sources of drinking water in the affected area; public health; and tribal cultural resources. The County also received input during scoping

regarding the identification of alternatives to the Project and considerations to be evaluated as part of the cumulative scenario.

ES.10 Issues to be Resolved

Section 15123(b)(3) of the CEQA Guidelines requires that an EIR contain issues to be resolved, which include the choice among alternatives and whether or how to mitigate significant impacts. The following major issues are to be resolved:

- Determine whether the EIR adequately describes the environmental impacts of the Project;
- Choose among alternatives;
- Determine whether the recommended mitigation measures should be adopted or modified; and
- Determine whether or not additional mitigation measures need to be applied to the Project.

ES.11 References

California Energy Commission (CEC), 2014. Energy Infrastructure Map of Northern California. May 21, 2014.

California Independent System Operator (CAISO), 2008. California (CAISO) Electric Regions. February 2008.

California Public Utilities Commission (CPUC), 2018. Delivery, Consumption & Prices for Utility Service within California. Available online: https://www.cpuc.ca.gov/uploadedFiles/CPUC_Public_Website/Content/About_Us/Organization/Divisions/Policy_and_Planning/PPD_Work/PPD_Work_Products_(2014_forward)/California%20Regions%20Final.pdf. January 18, 2018.

Pacific Gas & Electric Company (PG&E), 2014. Service Area Map. Available online: https://www.pge.com/tariffs/tm2/pdf/ELEC_MAPS_Service_Area_Map.pdf. Effective December 17, 2014.

U.S. Department of Energy (DOE), 2020. WINDExchange Ordinances Database. Available online: https://windexchange.energy.gov/policies-incentives?utf8=%E2%9C%93&search=california. Accessed January 17, 2020.

CHAPTER 1
Introduction

1.1 Purpose of This Document

This Draft Environmental Impact Report (EIR) is an informational document intended to disclose to the public and decision-makers the potential environmental impacts of the Fountain Wind Project (Project). The Shasta County (County) Department of Resource Management, Planning Division, as the lead agency under the California Environmental Quality Act (CEQA),[1] has prepared this Draft EIR to document its analysis of the potential direct, indirect, and cumulative impacts of the Project described in Section 2.4, *Description of the Project*, and the alternatives described in Section 2.5, *Description of Alternatives*. All resource areas in the CEQA Guidelines Appendix G Checklist have been studied: Aesthetics, Agriculture and Forestry Resources, Air Quality, Biological Resources, Cultural Resources, Energy, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Mineral Resources, Noise, Population and Housing, Public Services, Recreation, Transportation, Tribal Cultural Resources, Utilities and Service Systems, and Wildfire. The potential for the Project to result in communications interference is also examined. See Chapter 3, *Environmental Analysis*.

The County will rely on the analysis in this Draft EIR, as it may be amended in response to agency and public input, along with other information in the record, in deciding whether to approve, approve with modifications, or disapprove the requested Use Permit (UP 16-007) to construct, operate, maintain, and ultimately decommission the Project. Other agencies with trustee responsibilities or permitting authority over the Project, including but not limited to the California Department of Forestry and Fire Protection (CAL FIRE), California Department of Fish and Wildlife (CDFW), California Public Utilities Commission (CPUC), and the Regional Water Resources Control Board (RWQCB), may rely on this document in deciding whether to approve or issue other authorizations for the Project.

1.2 Project Overview

The Project is a renewable wind energy generation development proposed on a 4,464-acre site (Project Site) in unincorporated Shasta County. More specifically, the applicant proposes to construct, operate, maintain, and ultimately decommission up to 72 wind turbines and associated transformers together with associated infrastructure and ancillary facilities. Each turbine would be

[1] This analysis is being prepared CEQA (Pub. Res. Code §21000 et seq.) and its implementing regulations, the CEQA Guidelines (14 Cal. Code Regs. §15000 et seq.).

no more than 679 feet tall, as measured from ground level to vertical blade tip (total tip height), and would have a generating capacity of 3 to 5.7 megawatts (MW). The Project would have a maximum total nameplate generating capacity of up to 216 MW.[2]

Associated infrastructure and facilities would include: a 34.5-kilovolt (kV) overhead and underground electrical collector system to connect the electricity generated by individual turbines together and deliver the electricity to an onsite collector substation; underground or overhead fiber-optic communication lines (or, in the alternative, a relay microwave tower); an onsite switching station to connect the Project to the regional grid operated by Pacific Gas and Electric Company (PG&E); interconnection facilities to allow the interconnection to the grid (to be owned and operated by PG&E); a temporary construction and equipment laydown area; 14 temporary laydown areas distributed throughout the Project Site to store and stage building materials and equipment; an operation and maintenance (O&M) facility; up to four permanent meteorological (MET) towers; temporary, episodic deployment of mobile Sonic Detection and Ranging (SoDAR) or Light Detection and Ranging (LiDAR) systems within identified disturbance areas (e.g., at MET tower locations); two storage sheds; the potential for new groundwater wells; three temporary concrete batch plants; and a septic system. Existing commercial timber within the Project Site would be harvested as needed to construct the proposed infrastructure. New access roads would be constructed within the Project Site, and existing roads would be improved. The Project would operate year-round. Both scheduled and unscheduled maintenance events would occur. Project decommissioning and site restoration activities would result in the removal of Project infrastructure from the Project Site and, in coordination with the landowner, disturbed areas would be replanted with the goal of developing a vegetation cover, composition, and diversity similar to the area's ecological setting and consistent with the landowner's current and future land use practices.

1.3 Use of this Document by Agencies

CEQA Guidelines §15124(d) requires that an EIR contain a statement briefly describing the intended uses of the EIR. The following discussion summarizes the roles of the lead agency and any responsible agencies and the intended uses of the EIR in their approval or permitting processes; see Section 2.6, *Permits and Approvals,* for additional detail.

Shasta County has the primary responsibility for considering whether to approve the requested Use Permit for the Project, is the CEQA "lead agency" for purposes of this Draft EIR, and has directed the preparation of the EIR. This analysis will be used by the County, in conjunction with other information developed in the County's formal record, when considering whether to approve, approve with conditions, or deny the requested Use Permit. Other necessary County approvals may include a Hazardous Materials Business Plan, septic system permit, and well permit from the Shasta County Department of Resource Management, Environmental Health Division; building

[2] "Nameplate capacity" is the amount of power that would be generated under ideal conditions. Actual output can differ from nameplate capacity for a number of reasons, including wind speeds and other weather conditions, and equipment maintenance.

and grading permits from the Shasta County Building Division; and an encroachment permit from the Shasta County Public Works Department.

CAL FIRE has primary jurisdiction over timber conversion and timber harvesting, each of which would require discretionary approval prior to construction of the Project. As a "responsible agency" for purposes of CEQA, CAL FIRE would rely on the EIR, once it is certified, in deciding whether to approve a Timber Conversion Permit and Timber Harvest Plan pursuant to the Z'berg-Nejedly Forest Practice Act and Forest Practice Rules (CAL FIRE, 2019). Other agencies also may rely on information in this EIR to inform their own permitting decisions and approvals for the Project.

1.4 CEQA Process Overview

This EIR has been prepared in accordance with CEQA (Public Resources Code [Pub. Res. Code] §21000 et seq.) and its implementing regulations, the CEQA Guidelines (14 California Code of Regulations [Cal. Code Regs.] §15000 et seq.). CEQA requires state and local government agencies to consider the environmental consequences of projects over which they have discretionary authority before taking action on those projects. Shasta County, as lead agency, considered the potential impacts of the Project in an Initial Study before determining that an EIR would provide the appropriate level of CEQA documentation for the Project. The Initial Study is included in Appendix A of the Scoping Report, which is provided as Appendix J of this Draft EIR.

The overall purposes of the CEQA process are:

1. Disclose to decision-makers and the public the potential significant environmental effects of a proposed discretionary project.

2. Prevent or minimize potential damage to the physical environment through the development of project alternatives, mitigation measures, and mitigation monitoring.

3. Enhance public participation in the environmental review process through scoping meetings, public notice, public review, and hearings.

4. Involve other potentially affected governmental agencies through coordination, early consultations, the scoping process, and State Clearinghouse review.

As defined in CEQA Guidelines §15378, a "project" is any action that "has a potential for resulting in either a direct physical change in the environment, or a reasonably foreseeable indirect physical change in the environment." CEQA Guidelines §15093 requires the County, as the lead agency, to balance the benefits of a proposed project against any significant unavoidable environmental effects it may have. If the benefits of the Project outweigh the significant unavoidable adverse impacts, then the County may adopt a statement of overriding considerations that finds the environmental consequences to be acceptable in light of the Project's benefits to the public. The environmental review process as set forth under CEQA is outlined below.

1.4.1 Pre-scoping Activities

The County initiated pre-scoping activities following receipt of the application for Use Permit No. 16-007 in November 2016. Pre-scoping activities included initial agency and community outreach, the results of which efforts were documented in an Initial Study, and consultation with Tribes pursuant to Assembly Bill (AB) 52. The Initial Study, initial outreach efforts, and the AB 52 consultation process are summarized in the Scoping Report (Appendix J).

1.4.1.1 Initial Study

Pre-scoping activities included the preparation of an Initial Study. On the basis of the Initial Study, the County determined that preparation of this EIR would be required.

1.4.1.2 Initial Agency and Community Outreach

As part of its initial outreach efforts, the County sent early consultation referrals for the Project to an expansive and broad range of local, state, and federal agencies, native American tribes, community organizations, media outlets, and others (Shasta County, 2018). Written responses were received from: the Burney Fire Protection District, California Department of Fish and Wildlife, California Department of Transportation, Central Valley Regional Water Quality Control Board, Shasta County Assessor/Recorder, Shasta County Air Quality Management District, Shasta County Fire Department, Shasta County Office of the Sheriff, and the Shasta Mosquito and Vector Control District. Initial community outreach included communications with: the Pit Rive Tribe, Frontier Communications, and the Wintu Audubon Society. Correspondence with these agencies and members of the community is documented in the Initial Study.

1.4.1.3 Tribal Consultation Pursuant to AB 52

Pursuant to the AB 52 Tribal consultation process, CEQA lead agencies consult with tribes that are traditionally and culturally affiliated with the project area and that have requested consultation pursuant to Pub. Res. Code §21080.3.1. The purpose of the consultation is to determine whether a proposed project may result in a significant impact to tribal cultural resources. As set forth in Pub. Res. Code §21080.3.1(b), the law requires:

> *Prior to the release of a negative declaration, mitigated negative declaration, or environmental impact report for a project, the lead agency shall begin consultation with a California Native American tribe that is traditionally and culturally affiliated with the geographic area of the proposed project if: (1) the California Native American tribe requested to the lead agency, in writing, to be informed by the lead agency through formal notification of proposed projects in the geographic area that is traditionally and culturally affiliated with the tribe, and (2) the California Native American tribe responds, in writing, within 30 days of receipt of the formal notification, and requests the consultation.*

The County's AB 52 contact list consists of Native American tribes that had submitted written requests for notification of CEQA projects within their geographic area of traditional and cultural affiliation as of December 8, 2017, when the County initiated consultation. The County sent letters by certified mail on December 8, 2017, to two representatives of the Pit River Tribe:

Mickey Gemmill (Shasta County, 2017a) and Morning Star Gali (Shasta County, 2017b). Each letter identified the area within which the Project is proposed as within the Tribe's geographic area of traditional and cultural affiliation. Return receipts for the certified letters indicate the letters were delivered on December 8, 2017. The County received no response to either letter. Although the AB 52 process formally closed when no response was received to the December 8, 2017 letters, the County has continued efforts to connect directly with representatives of the Pit River Tribe and has used this information in the analysis of potential impacts on resources of importance to the Tribe and its members.

1.4.2 Scoping Activities

CEQA Guidelines §15083 provides that a "Lead Agency may…consult directly with any person…it believes will be concerned with the environmental effects of the project." Scoping is the process of early consultation with affected agencies and the public prior to completion of a Draft EIR. Section 15083(a) states that scoping can be "helpful to agencies in identifying the range of actions, alternatives, mitigation measures, and significant effects to be analyzed in depth in an EIR and in eliminating from detailed study issues found not to be important." Scoping is an effective way to bring together and consider the concerns of affected State, regional, and local agencies, the project proponent, and other interested persons (CEQA Guidelines §15083[b]). The purpose of scoping is to determine the scope of information and analysis to be included in an EIR and, thereby, to ensure that an appropriately comprehensive and focused EIR will be prepared that provides a firm basis for informed decision-making.

The scoping process for this EIR included the following:

1. **Notice of Preparation (NOP):** On January 15, 2019, the County published and distributed an NOP accompanied by the Initial Study described above, to advise interested local, regional, state, and federal agencies, as well as the public, that an EIR would be prepared for the Project. The County sent the NOP package to trustee, responsible, and potentially affected federal agencies; to the Governor's Office of Planning and Research/State Clearinghouse; and to the Shasta County library in Redding, Anderson and Burney.

2. **Additional public notifications:** The County sent separate notice to a mailing list of 603 recipients that included Tribes, property owners within 2 miles of the Project Site, and other interested parties. The County also posted an electronic copy of the NOP and the direct-mail notice on its website: https://www.co.shasta.ca.us/index/drm_index/planning_index/eirs/fountain-wind-project. In addition to the NOP, direct mail notifications, and web posting, the County notified the public about the public scoping meeting through newspaper advertisements published in the *Record Searchlight* on January 15, 2019, in the *Mountain Echo* on January 15, 2019, and in the Intermountain News on January 16, 2019.

3. Agency-**specific scoping meeting:** The County held an agency-specific scoping meeting for responsible and trustee agencies on Thursday, January 24, 2019, at 2 p.m. at the Shasta County Administration Building. A follow-up site visit was held on January 25 to further inform County and other agency representatives about the specifics of the proposed site.

4. **Public meeting:** A meeting was held on Thursday, January 24, 2019, at Montgomery Creek Elementary School to provide information to the public about the Project and the CEQA

process, and to solicit scoping input from attendees. Doors opened to view Project information at 6:30 p.m.; the public scoping meeting began at 7 p.m. Presentation slides, the "storyboards" displayed at the meeting, and a transcript of comments made by speakers at the meeting are provided in the Scoping Report (Appendix J).

5. **Scoping period:** The EIR scoping period lasted from January 15 to February 22, 2019. In addition to oral comments made at the public scoping meeting, written input was received from approximately 150 entities. All input received on or before end of the scoping period is documented in the Scoping Report provided as Appendix J to this Draft EIR.

1.4.3 Draft EIR

Preparation of the Draft EIR follows and is informed by the scoping process. Article 9 of the CEQA Guidelines (§§15120–15132) establishes the required contents of an EIR. These are summarized below.

1. **Table of contents or an index:** A table of contents is provided.

2. **Summary:** An executive summary is provided (see p. ES-1 et seq.).

3. **Project description:** A description of the Project is provided (see p. 2-1 et seq.).

4. **Environmental Setting:** The environmental setting is described on a resource-by-resource basis throughout Chapter 3.

5. **Analysis of direct, indirect, and cumulative impacts of the proposed project:** Potential impacts of the Project are described on a resource-by-resource basis throughout Chapter 3.

6. **Consideration and discussion of mitigation measures proposed to minimize potential significant impacts:** Mitigation measures are proposed to minimize potential significant impacts (see, e.g., Table ES-2, *Summary of Project Impacts and Mitigation Measures*).

7. **Consideration and discussion of alternatives to the proposed project, including a No Project Alternative:** The alternatives development screening process, alternatives rejected from detailed consideration, and the alternatives evaluated in detail on a resource-by-resource basis throughout Chapter 3 are described in Chapter 2 (see p. 2-27 et seq.).

8. **Organizations and persons consulted:** Federal, state, and local agencies; Tribal entities and members; and organizations and individuals consulted pursuant to the preparation of this Draft EIR are identified in Section 5.4, *Entities Consulted and Recipients of the Draft EIR* (p. 5-2 et seq.).

1.4.4 Agency and Public Review

As required by CEQA, this Draft EIR is being made available for agency and public review and comment for a period of at least 45 days. Copies were provided to the State Clearinghouse for circulation to interested state agencies. Printed copies of the Draft EIR and electronic copies of all appendices and all documents referenced in the Draft EIR are available for public review during normal hours at the Shasta County library in Redding, Anderson, and Burney and also are available for review by members of the public at the Shasta County Department of Resource Management

office by appointment. An electronic copy of the Draft EIR is available for all-hours access on the County's website: https://www.co.shasta.ca.us/index/drm_index/planning_index/eirs/fountain-wind-project.

Notifications of the availability of the Draft EIR and information about how to access it were sent directly to responsible, trustee, and local agencies; the Shasta County Clerk's office; and to the Tribal entities and members, organizations, individuals identified in Section 5.4, *Entities Consulted and Recipients of the Draft EIR* (p. 5-2 et seq.). Notice of the availability of the Draft EIR also was published in the *Record Searchlight*, in the *Mountain Echo*, and in the *Intermountain News*.

Please submit any written comments on the Draft EIR to the address shown below:

> Shasta County Dept. of Resource Management, Planning Division
> Attention: Lio Salazar, AICP, Senior Planner
> 1855 Placer Street, Suite 103
> Redding, CA 96001
> E-mail: fw.comments@co.shasta.ca.us

The County will review all substantive comments received during the review period and provide written responses in a Final EIR. The Final EIR will be made available to agencies and the public, and will provide a basis for agency decision-making.

1.4.5 Final EIR

After the end of the Draft EIR's public review period, the Shasta County Department of Resource Management will prepare a Final EIR for consideration by the public and the Shasta County Planning Commission. The Final EIR will include comments received on the Draft EIR, written responses to substantive comments received, a list of commenters, and identification of revisions to the EIR made in response to the comments received. The Planning Commission will review and consider the Final EIR before taking action on the Project.

1.4.6 Findings of Fact

After publication of the Final EIR and before deciding whether to certify the EIR or approve, modify, or deny the Project, the County will make the following findings regarding each significant impact consistent with Pub. Res. Code §21081:

1. Changes or alterations have been required in, or incorporated into, the Project which mitigate or avoid the significant effects on the environment;

2. Those changes or alterations are within the responsibility and jurisdiction of another public agency and have been, or can and should be, adopted by that other agency; or

3. Specific economic, legal, social, technological, or other considerations, including considerations for the provision of employment opportunities for highly trained workers, make infeasible the mitigation measures or alternatives identified in the EIR.

With respect to any significant effects that are subject to the third finding, the County must find that specific overriding economic, legal, social, technological, or other benefits of the Project outweigh its potential to result in significant unavoidable adverse effects on the environment before it could approve the Project. A statement of overriding considerations would not otherwise be required.

1.5 References

California Department of Forestry and Fire Protection (CAL FIRE), 2019. California Forest Practice Rules 2019. Available online: http://calfire.ca.gov/resource_mgt/downloads/2019%20Forest%20Practice%20Rules%20and%20Act_FINAL.pdf. February 2019.

Shasta County, 2017a. Letter from Bill Walker, AICP, Senior Planner, Shasta County Department of Resource Management, to Mickey Gemmill, Chairman, Pit River Tribe, regarding Tribal Cultural Resources under the California Environmental Quality Act, AB 52 (Gatto, 2014). Formal Notification of Determination that a Project Application is Complete, pursuant to Public Resources Code §21080.3.1. Available online: https://www.co.shasta.ca.us/docs/libraries/resource-management-docs/projects/fountain-wind-project/ab52/ltrpitrivertribemorningmickeygemmillchairman120717.pdf. December 8, 2017.

Shasta County, 2017b. Letter from Bill Walker, AICP, Senior Planner, Shasta County Department of Resource Management, to Morning Star Gali, Tribal Historic Officer, Pit River Tribe, regarding Tribal Cultural Resources under the California Environmental Quality Act, AB 52 (Gatto, 2014). Formal Notification of Determination that a Project Application is Complete, pursuant to Public Resources Code §21080.3.1. Available online: https://www.co.shasta.ca.us/docs/libraries/resource-management-docs/projects/fountain-wind-project/ab52/LtrPitRiverTribeMorningStarGaliTribalHistoricOfficer120717.pdf. December 8, 2017.

Shasta County, 2018. Use Permit 16-007. Fountain Wind Project Referral Distribution List. January 4, 2018.

CHAPTER 2
Description of Project and Alternatives

2.1 Project Overview

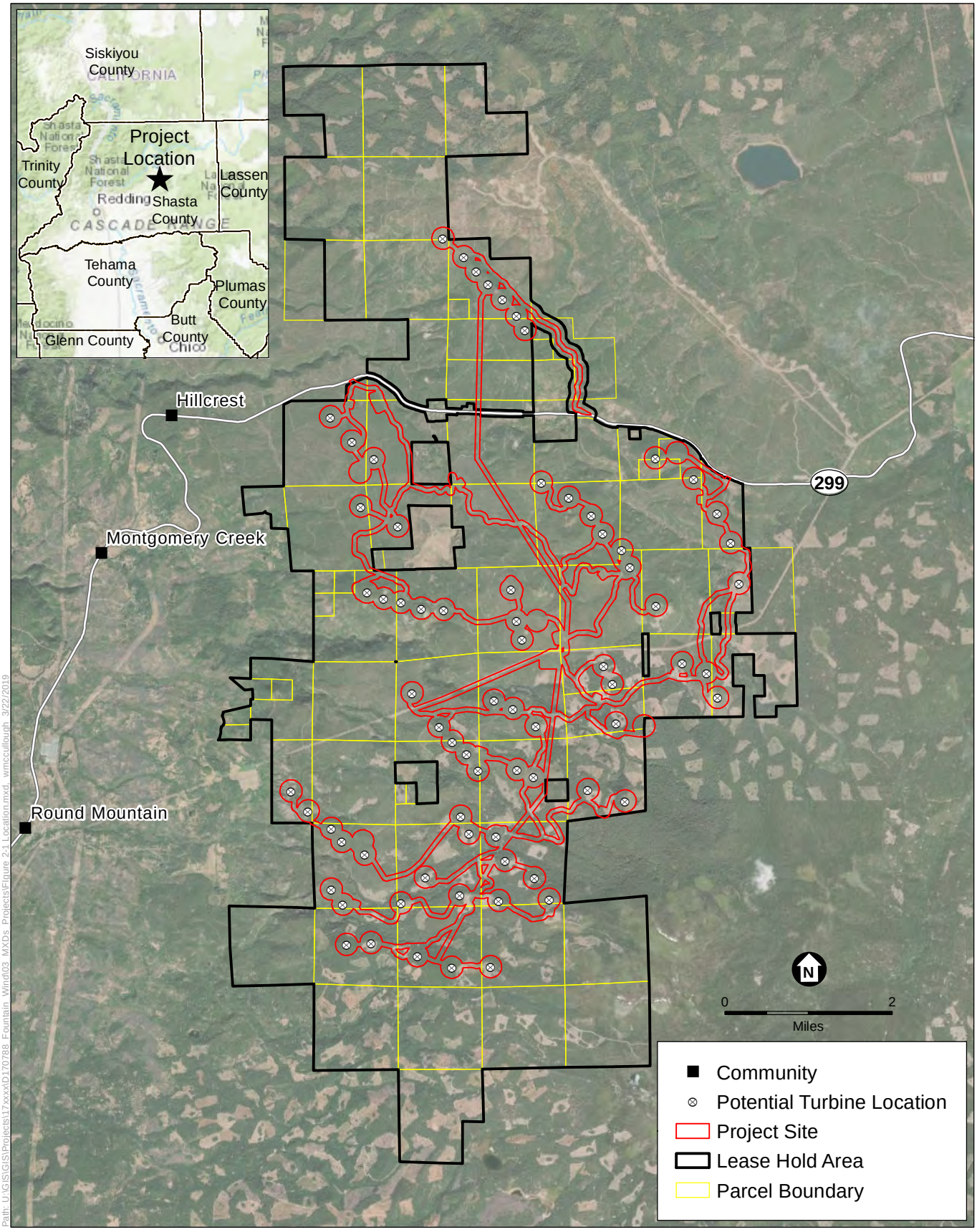
The Fountain Wind Project (Project) is a wind energy generation development proposed by Fountain Wind LLC (Applicant), in an unincorporated area of Shasta County. The Applicant has applied for a Use Permit (UP 16-007) to construct, operate, maintain, and decommission wind turbines and related infrastructure within an approximately 29,500-acre leased area encompassing 74 Shasta County (County) Assessor's Parcels. Within the leasehold area, the Project would be developed within an 4,464-acre area (Project Site) where the permanent project facilities would be sited. The Project Site includes all area where either temporary or permanent disturbance may occur. See **Figure 2-1**, *Project Location*.

The County, as the Lead Agency under the California Environmental Quality Act (CEQA),[1] is preparing this Environmental Impact Report (EIR) to document its analysis of the potential impacts of the Project described in Section 2.4, *Description of the Project*, and the alternatives described in Section 2.5, *Description of Alternatives*.

The Project described in Section 2.4 reflects refinements made since the July 2017 Use Permit application filing date based on the Applicant's further environmental and engineering review. Briefly, the Applicant proposes fewer, taller wind turbines than initially proposed: a decrease from 100 to up to 72 turbines and an increase in maximum height from 591 feet to 679 feet tall, as measured from ground level to vertical blade tip (total tip height), with hub heights of up to approximately 410 feet (125 meters) and rotor diameters of up to approximately 531.5 feet (162 meters). With fewer turbines, the Project analyzed in this EIR also includes reduced access roads, collection systems, and related infrastructure relative to the initial proposal. Each turbine would have a generating capacity of 3 to 5.7 megawatts (MW). Overall, the Project would have a total nameplate generating capacity of up to 216 MW.[2] Associated infrastructure and facilities would include: a 34.5-kilovolt (kV) overhead and underground electrical collector system to connect turbines together and to an onsite collector substation; overhead and underground fiber-optic communication lines; an onsite switching station to connect the Project to the regional grid operated by the Pacific Gas and Electric Company (PG&E); a temporary construction and

1 This analysis is being prepared pursuant to CEQA (Pub. Res. Code §21000 et seq.) and its implementing regulations, the CEQA Guidelines (14 Cal. Code Regs. §15000 et seq.).

2 "Nameplate capacity" is the amount of power that would be generated under ideal conditions. Actual output can differ from nameplate capacity for a number of reasons, including wind speeds and other weather conditions, and equipment maintenance.



Fountain Wind Project

Figure 2-1
Project Location

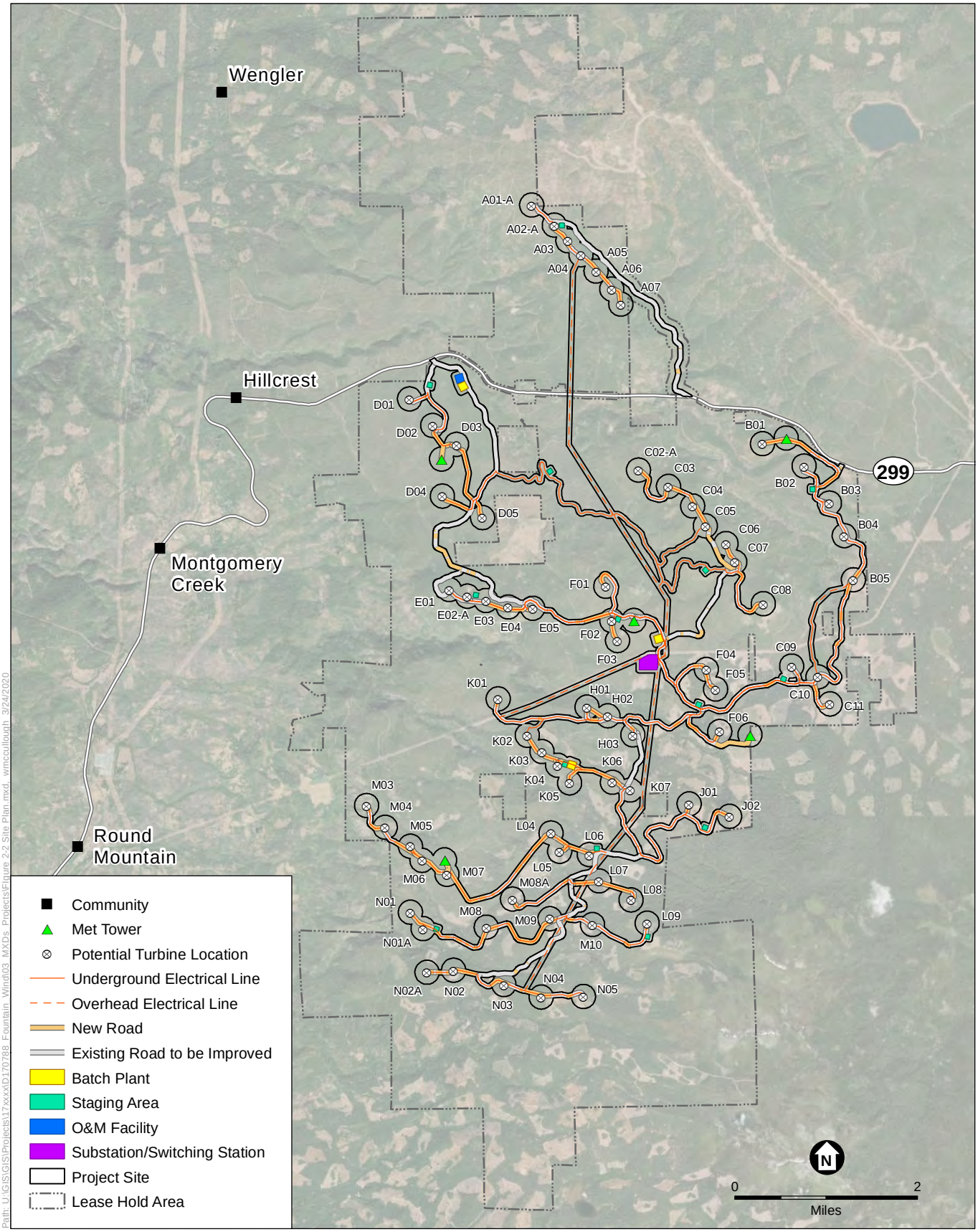
equipment laydown area; 14 temporary laydown areas distributed throughout the Project Site to store and stage building materials and equipment, an operation and maintenance (O&M) facility with employee parking; up to four permanent meteorological evaluation towers (METs); temporary, episodic deployment of mobile Sonic Detection and Ranging (SoDAR) or Light Detection and Ranging (LiDAR) systems within identified disturbance areas (e.g., at MET locations); two storage sheds; and three temporary batch plants. New access roads would be constructed within the Project Site, and existing roads would be improved. See **Figure 2-2**, *Project Site Plan*, which shows the proposed layout of Project components. The Project would operate year-round.

2.2 Project Location

The Project Site is located approximately 1 mile west of the existing Hatchet Ridge Wind Project, 6 miles west of Burney, 35 miles northeast of Redding, immediately north and south of State Route (SR) 299, and near the private recreational facility of Moose Camp.[3] Other communities near the Project Site include Montgomery Creek, Round Mountain, Wengler and Big Bend. The project site is also within in a geographic area that is traditionally and culturally affiliated with the Pit River Tribe. Access to the Project Site is provided locally by SR 299, Moose Camp Road, and three existing, gated logging roads, and would be provided regionally by highways that provide access to SR 299, including Interstate 5 (I-5), which is approximately 35 miles to the west of the Project Site, and SR 139, which is approximately 60 miles to the east of the Project Site.

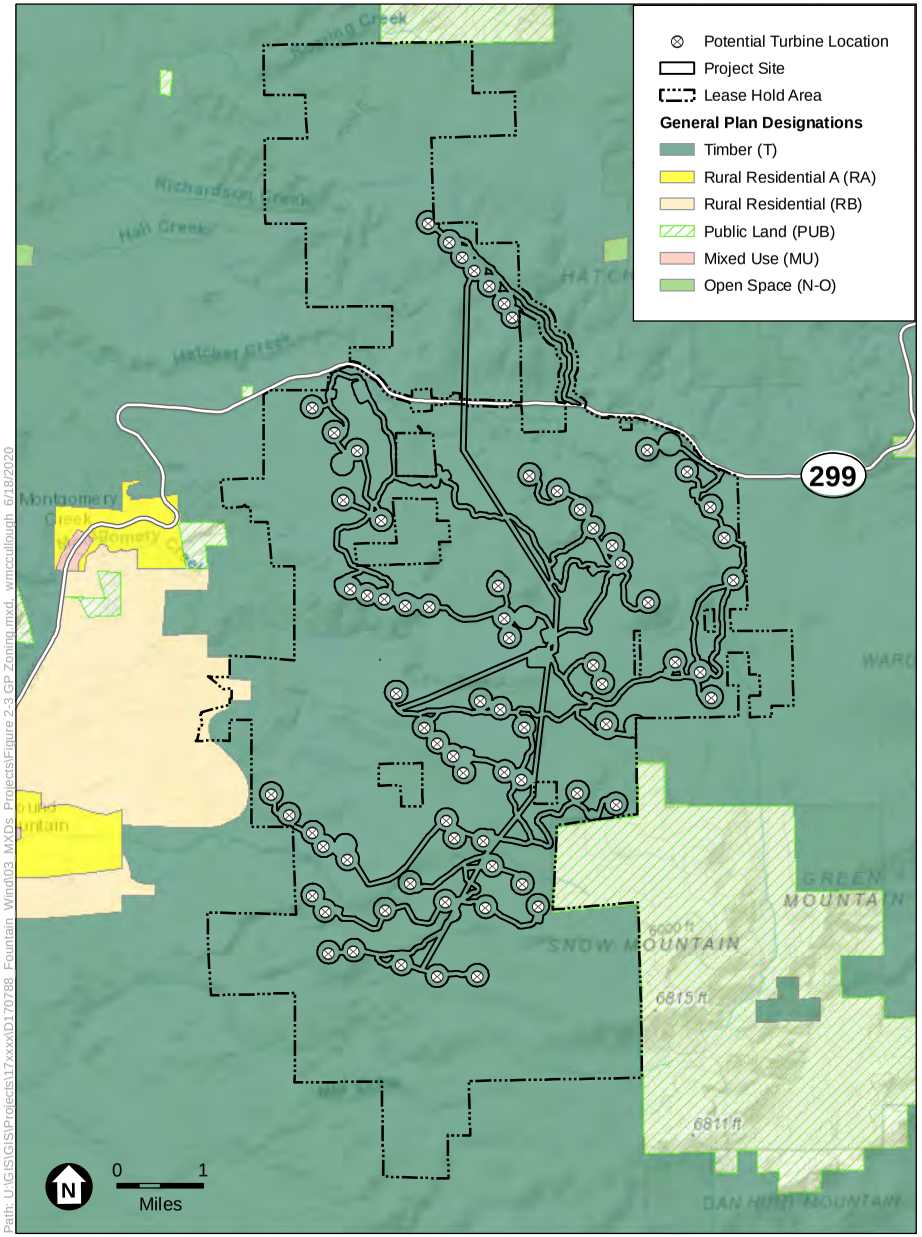
The Project Site is located within the southern end of the Cascade Range with topography characterized by buttes and peaks separated by small valleys. The Lassen National Forest lies to the southeast, and the Shasta-Trinity National Forest is to the north. Other surrounding lands are privately owned; many are used for timber harvesting purposes. Elevations within the Project Site range from 3,000 to 6,000 feet above sea level. Little Cow Creek and the south fork of Montgomery Creek cross the Project Site from east to west. Other small tributaries run through the valleys. Northern portions of the leasehold were affected by the 1992 Fountain Fire, as evidenced by burn scars. The Shasta County General Plan designates the Project Site as Timber (T); the zoning designations are Timber Production (TP) (approximately 4,457 acres) and Unclassified (U) (approximately 6 acres). See **Figure 2-3**, *General Plan Land Use and Zoning Designations*. The existing land use within the Project Site consists exclusively of managed forest lands. Logging roads (some of which are unpaved) and transmission lines cross the Project Site.

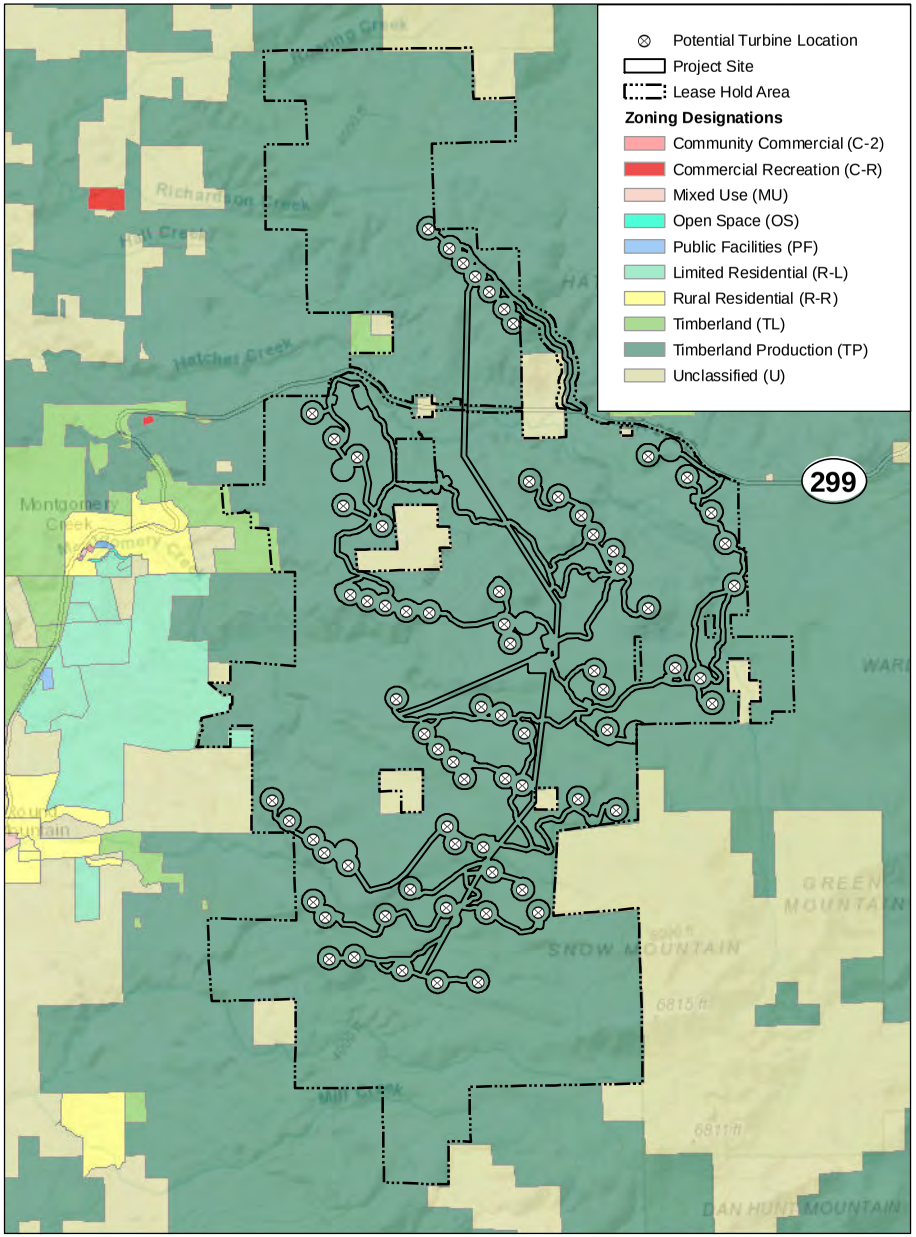
[3] Moose Camp is an approximately 146-acre private recreational facility owned and operated by Moose Recreational Camp, Ltd., a California Non-Profit Mutual Benefit Corporation, for the benefit of its approximately 75 members and their families (Moose Recreational Camp, Ltd., 2012a, 2012b; Appendix J, *Scoping Report* [Letters P17, P23, P37, P43, P55]). In Moose Camp, 50 cabin residences are used year-round (Appendix J, *Scoping Report* [Letters P17, P23, P37, P43, P55]).



Fountain Wind Project

Figure 2-2
Site Plan





General Plan Land Use Designations

Zoning Designations

Fountain Wind Project

Figure 2-3

General Plan Land Use and Zoning Designations

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SOURCE: Shasta County, 2019

2.3 Project Objectives

The Applicant seeks to build the Fountain Wind Project to meet the following objectives:

1. Develop, construct, and operate a commercial wind energy generation facility capable of generating up to 216 MW of wind energy.
2. Interconnect to the Northern California electrical grid (NP15).[4]
3. Locate the Project in close proximity to an existing transmission line with sufficient capacity to reduce impacts and costs associated with building new transmission infrastructure.
4. Assist California in meeting the renewable energy generation targets set in Senate Bill (SB) 100.[5]
5. Create temporary and permanent jobs in Shasta County and contribute to the County's tax base.
6. Obtain entitlements to construct and operate a commercially financeable wind energy project.
7. Support landowners through diversification of revenue streams.
8. Offset approximately 128,000 metric tons of carbon dioxide emissions generated by fossil fuels.
9. Provide emissions-free energy for approximately 100,000 households.[6]

2.4 Description of the Project

The Project consists of three major components: (1) Up to 72 turbines, including associated concrete foundations, pads, and temporary construction areas; (2) 34.5 kV overhead and underground collector lines and fiber optic communication cabling; and (3) an onsite substation and switching station for connecting the Project into the existing PG&E transmission line (Figure 2-2). All of these improvements would be entirely within the Project Site. The elements of each of these major components are described in more detail below. Ancillary facilities and infrastructure also would be required, including access roads, temporary construction laydown areas, an O&M facility, up to four permanent METs (five potential locations are being analyzed), storage sheds, and up to three temporary concrete batch plants. Project components and disturbance areas, including for the removal of vegetation/timber and timber conversion, are summarized in **Table 2-1**, *Project Components and Disturbance Areas*.

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4 The California Independent System Operator (CAISO) manages the operation of California's power grid, including the generation and transmission of electricity by PG&E and the CAISO's other member utilities. The CAISO divides the state into three regions: NP15, SP15, and ZP26. NP15 corresponds to PG&E's electric service territory (CAISO, 2008; PG&E, 2014). An existing 230 kV line crosses the Project Site south of SR 299 (CEC, 2014). The Project would interconnect to the grid along this line.

5 SB 100 was signed into law on September 10, 2018. This bill accelerates the state's renewable energy goals, requiring 60 percent of California's electricity portfolio to come from eligible renewable sources by 2030 and that all retail electricity be carbon-free by 2045.

6 The California Public Utilities Commission (CPUC) reported in 2018 that "California households consume electric service at an average rate of 534 kWh per month in the summer months, and 459 kWh per month in the winter months" (CPUC, 2018a). If California households consume an average of 496.5 kWh per month (or 5.958 MWh per year), then the Project's generation of 605,491 MWh of electricity per year could serve an estimated 101,627 households per year.

TABLE 2-1
PROJECT COMPONENTS AND DISTURBANCE AREAS

Project Component	Quantity	Total Temporary Construction Disturbance Area	Permanent Disturbance Area
Turbines and pads (including temporary turbine construction areas)	Up to 72	5 acres per turbine (up to 360 total acres)	2.5 acres per turbine (up to 180 total acres)[a]
Underground electrical collector system[b]	Up to 51 miles	50-foot-wide corridor, up to a total of 309 acres	30-foot-wide corridor cleared of large vegetation, up to a total of 185 acres
Overhead electrical collector line and associated roads, work footprint, and permanent 2-track access road[c]	Up to 12 miles	100-foot-wide corridor, up to a total of 145 acres	80-foot-wide right of way cleared of large vegetation, up to a total of 116 acres
Onsite collector substation	1	8 acres	5 acres
Onsite switching station (including interconnection equipment)	1	11 acres	8 acres
Access roads (including crane roads)	Up to 24 miles of new roads	80-foot-wide disturbance area, up to a total of 233 acres. Nominally up to 200-foot-wide construction clear area in some locations to accommodate grading, slope stabilization, and blade delivery.	20-foot-wide drivable surface with a 1-foot shoulder on both sides and up to an additional 10 feet on either side where required for storm water drainage design, up to a total of 122 acres. Permanent disturbance width nominally up to 200 feet in some locations.
Widen existing 16-foot-wide access roads	Up to 33 miles of existing roads may be widened	80-foot-wide disturbance area (16 feet of which are already disturbed), up to 256 acres of new disturbance. Nominally up to 200-foot-wide construction clear area in some locations to accommodate grading, slope stabilization, and blade delivery.	Permanently widen to 20 feet with a 1-foot shoulder on both sides and up to 10 feet on either side where required for storm water drainage design, up to 96 acres. Permanent disturbance width nominally up to 200 feet in some locations.
O&M facility	1	5 acres	5 acres (including a 5,460-square foot O&M building and two 0.5-acre Operations storage sheds)
Temporary construction and equipment area, construction trailer area, and associated parking area	1	10 acres	0 acres
Temporary laydown areas	14	2 acres per laydown area (28 acres total)	0 acres
Temporary concrete batch plant, if necessary	3	3 to 5 acres per batch plant (up to 15 acres total)	0 acres
MET Towers	4	1 acre per structure (4 acres total)	0.5 acre per structure (2 acres total)
Anticipated Total Temporary Construction Disturbance[d]: 1,384 acres			
Anticipated Total Permanent Disturbance: 713 acres			

NOTES:

[a] The area of permanent disturbance for each turbine includes an approximately 0.5-acre area to accommodate the footprint of the turbine, related components, and gravel access pad. An additional area, up to approximately 2.0 acres, would be maintained clear of taller vertical vegetation during operations and maintenance and would serve as defensible fire space around each turbine.

[b] Portions of the underground collector system would be located within the access road construction buffer to minimize impacts. No additional permanent impacts would occur in these areas. This acreage includes the co-located underground communications system.

[c] Acreage includes co-located overhead communications system. An 80-foot-wide corridor centered on the overhead electrical collector line is assumed for disturbance calculations.

[d] Timber harvested and timberland to be coverted is included within the anticipated disturbance areas.

SOURCE: Stantec, 2018 (in Draft EIR Appendix J)

2.4.1 Wind Turbine Generators

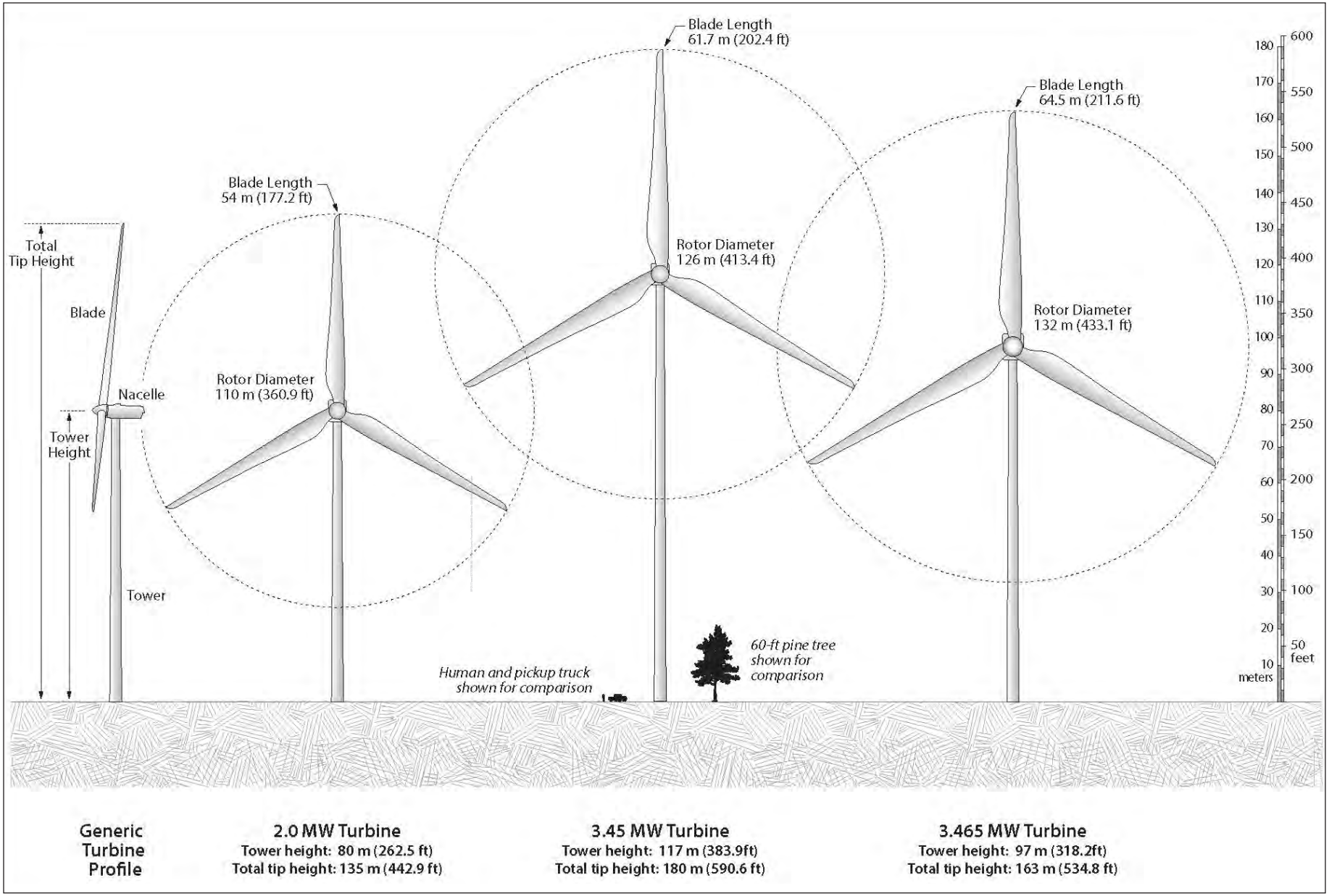
The site plan shown in Figure 2-2 depicts 72 turbine sites that are being considered as part of the Project. Final design may include fewer than 72 turbine sites. The 72 turbine sites represent feasible locations for a range of turbine models, each with different dimensions, generating capacity, and layout requirements. Prior to construction, the Applicant would determine which model would be installed based on component availability from the manufacturer, data on onsite wind resources, and other Project-specific factors. Regardless of the model ultimately selected, the Project would not exceed the proposed maximum 216 MW nameplate generating capacity.

The Project would construct, operate, maintain, and decommission up to 72 wind turbines, each with a nameplate generating capacity of 3.0 to 5.7 MW, to convert wind energy directly to electrical power to supply the existing electrical grid. The Project would use three-bladed, horizontal-axis turbines, meaning the rotor shaft and nacelle, which contains the electrical generator, would be mounted at the top of a cylindrical tower. A range of turbine heights are being considered; however, the maximum possible height would be 679 feet from ground level to the vertical turbine blade tip. Each turbine tower would be mounted on a concrete pedestal supported by a permanent foundation. Generic (non-Project-specific) turbine profiles are shown in **Figure 2.4a**, *Typical Wind Turbine*.

Designated turbines and METs would have flashing red lights installed to improve nighttime visibility for aviation and comply with Federal Aviation Administration (FAA) standards and Advisory Circular 70/7460-1L (FAA, 2016). In accordance with these standards, the Applicant would prepare a lighting plan for the Project and obtain FAA approval that would specify the installation of flashing red lights on designated turbines and METs to improve nighttime visibility for aviation. Because the height of the proposed turbines would be greater than 500 feet, it is expected that each would need to be lit with two lights. The Applicant would submit the FAA-approved plan to the County before turbine installation begins.

A commercial-scale wind turbine is made up of three main parts, including a tower, nacelle, and three blades that make up the rotor. The rotor is attached to the nacelle, which houses the generating components within a wind turbine, including the drive shaft, gearbox, generator, and controls. The tower provides the vertical support for the nacelle and rotor. Each turbine tower would be mounted on a concrete pedestal supported by a foundation. Spread footing foundations, which have a wide base that spreads the weight of the structure over a larger subsurface area for greater stability, are likely to be used for the foundation design. This type of foundation is buried underground to a depth of approximately 10 to 15 feet with a pedestal that extends approximately 1 foot above ground.

Turbine foundations would be designed based on the findings of a Project-specific, site-specific geotechnical investigation that would be prepared once final turbine locations have been verified. Section 1803 of the California Building Code specifies the required content of geotechnical reports. Existing law requires that the geotechnical investigation be conducted by a registered design professional and in accordance with the provisions of California Building Code



SOURCE: Pacific Wind Development, LLC.

NOTE: Generic turbine profiles are shown, not the specific turbines proposed for this Project. Dimensions of the proposed turbines are as described in Section 2.4, Description of the Project.

Fountain Wind

Figure 2-4a
Typical Wind Turbine

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Section 1803, as may be amended from time to time and as in effect at the time the investigation is conducted. Prior to finalizing the location of each turbine, soil borings would be collected to an approximately 50-foot depth, or as appropriate, to verify soil and rock characteristics and ensure sufficient soil strength and bearing capacity to provide a stable foundation for the turbine. Depending on the final turbine model selected, the widest underground portion of the turbine spread footing foundation would be between 50 to 80 feet in diameter. The aboveground, visible portion of the foundation is anticipated to be similar in diameter to the turbine tower, up to approximately 16 feet in diameter. A step-up transformer would be located either within the turbine nacelle or within a 9-foot by 9-foot reinforced concrete box pad located approximately 5 feet from the tower foundation. A typical turbine site is shown in Figure 4 of the Initial Study provided as part of the Notice of Preparation package in Draft EIR Appendix J, *Scoping Report*.

During construction, a temporary work area would be cleared and graded around each turbine, including the area to be occupied by the turbine foundation. The size and configuration of each work area would depend on the turbine site's terrain. Each work area would require an up to 250-foot by 300-foot area for foundation excavation and construction and turbine assembly. A typical work area is 200 feet by 250 feet depending on site conditions. The work area would be used to stage the construction crane, which would be used to hoist turbine sections into place. Depending on site conditions, additional temporary work space may be used for rotor assembly. Temporary work areas would be cleared and leveled to approximately a 2 percent slope or less. Within each work area, a crane pad would be constructed of compacted soil to provide a stable area for crane operation during turbine component installation. The size and location of each crane pad would be determined by the contractor. A portion of the crane pad would be left in place after construction and used for turbine repair or during decommissioning of the Project. Post-construction, a permanent, 15-foot gravel ring would be placed around the base of the foundation to provide a stable surface for maintenance vehicles and to minimize surface erosion and runoff. These permanent turbine pads would be between 65 and 95 feet in diameter, depending on the site conditions and final turbine model constructed. An area up to an additional 2 acres around the permanent turbine pad would be removed from timber production and maintained as low-growing vegetation.

2.4.2 Electrical Collector System and Communication System

A combination of overhead and underground 34.5 kV electrical collector lines would collect energy generated by the turbines and deliver it to an onsite collector substation, described in more detail in Section 2.4.3, *Project Substation, Switching Station and Interconnection Facilities*. A communication system also would be installed within the same footprint. The communication system consists of fiber optic communication cabling for the Supervisory Control and Data Acquisition (SCADA) system, which provides communication capabilities between turbine locations, substation, and operations and maintenance facilities. Most of the collector system would be located underground and adjacent to onsite access roads. However, portions of the collector system may be constructed overhead in response to environmental and engineering constraints such as:

- a large distance from generators to the substation;

- meeting the transmission limits of underground cable (20 to 25 MW);
- steep terrain where the use of a backhoe or trenching machine is infeasible or unsafe;
- stream and wetland crossings and cultural resource sites, where an overhead line would avoid or minimize an impact to the resource; or
- the presence of soils with low thermal conductivity or rocky conditions which could significantly increase trenching costs.

See also Figure 5 and Figure 6 of the Initial Study provided as part of the Notice of Preparation package in Draft EIR Appendix J, *Scoping Report*, which show conceptual design details of the proposed underground and overhead collector system.

2.4.2.1 Underground Collector System

The underground collector system would consist of insulated cables buried in trenches that are 46 inches deep and at least 12 inches wide. Each trench would contain power cables, a ground wire, a fiber optic communication cable, and a marker tape above the cables. Cables generally would be co-located with turbine access roads to minimize ground disturbance. In areas where the underground collector system would be co-located with both new and existing access roads, no additional ground disturbance would be required to install the underground electrical collection system beyond that which is disclosed in the impacts for the widening of the road. Where cable trenches cannot be co-located with access roads, a temporary, 50-foot-wide disturbance area would be required to install the cable. During operations, a permanent, 30-foot-wide corridor centered on the buried cable would be maintained clear of woody vegetation. The cables would terminate at individual turbines; the cables would connect from there to junction boxes, overhead power lines, or at the onsite substation. Junction boxes also would be installed on long collector runs between turbine strings. Blasting may be required prior to trenching in rocky areas.

2.4.2.2 Overhead Collector System

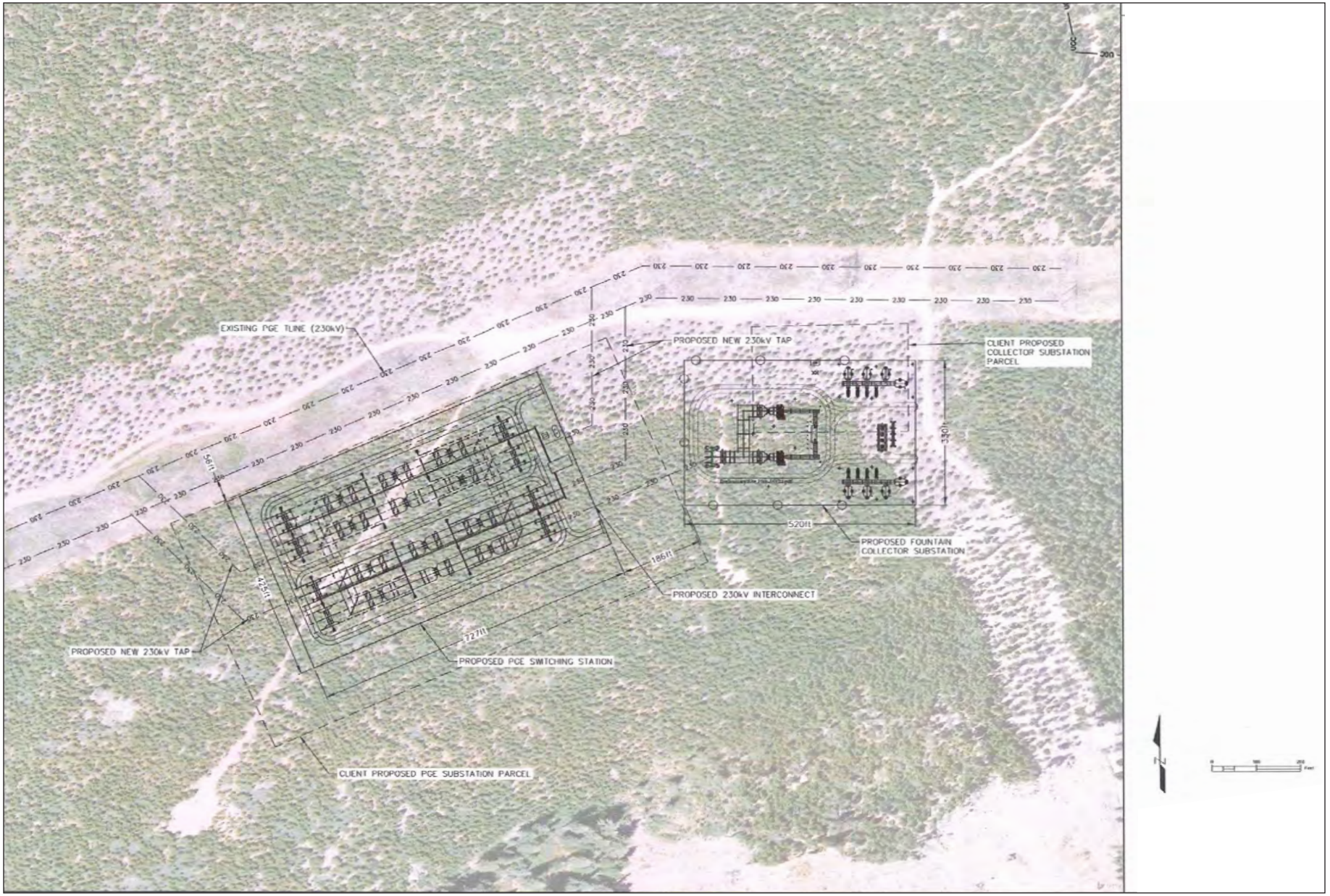
The 34.5 kV overhead electrical collector system would be installed on wood poles with a maximum height of 90 feet and wire heights between approximately 20 to 30 feet above the ground depending on the span; however, special circumstances could require greater wire clearances. Installation of the overhead collector line could require a temporary workspace consisting of an approximately 100-foot-wide corridor centered on the center line of the overhead line. An approximately 80-foot-wide corridor would be maintained during the operations phase. This area would be kept clear of taller woody vegetation to provide for safe operations and allow access for equipment inspections, vegetation control, and maintenance. Permanent disturbance impacts associated with the overhead collector system would be limited to the individual pole locations. All overhead collector lines would be designed in accordance with the Avian Protection Plan Guidelines prepared by the U.S. Fish and Wildlife Service (USFWS, 2005), and the Edison Electric Institute's Avian Power Line Interaction Committee (APLIC) guidance for reducing avian electrocution risk (APLIC, 2006) and risk of collisions with power lines (APLIC, 2012). Riser poles used to transition underground lines to overhead collectors would be constructed consistent with APLIC guidance for power pole configurations at wind energy projects (APLIC, 2019).

2.4.3 Project Substation, Switching Station and Interconnection Facilities

As described above, an onsite collector substation and switching station would increase the voltage of the electricity from the collection system's 34.5 kV to 230 kV to match the voltage of the existing PG&E 230 kV line. The preliminary substation and switching station designs are depicted in **Figure 2-4b**, *Preliminary Switching Station and Substation Site Plan*. The basic elements of the substation facilities include a control house, a bank of one or two main transformers, outdoor breakers, capacitor banks, relaying equipment, high-voltage bus work, steel support structures, an underground grounding grid, and overhead lightning-suppression conductors. The main outdoor electrical equipment and control enclosure would be installed on a concrete foundation.

The switching station would be located next to the Project substation and would facilitate the interconnection between the Project's electricity and the PG&E transmission lines. The Project would tap into the existing PG&E 230 kV line via an aboveground line tap located directly adjacent to the switching station. Minor modifications or upgrades to the existing 230 kV line may be required within the Project Site to facilitate the Project's interconnection. Upgrades to PG&E facilities are anticipated to include construction or reconfiguration of utility line structures and transmission line circuits involving four to six new transmission poles. If required, the new poles would be located adjacent to the proposed substation and switching station. Additionally, a relay microwave tower or overhead fiber optic communication circuits could be required. If required, the microwave relay tower would be up to 150 feet tall and would be located within the switching station permanent footprint. The tower would be a self-supporting lattice or lattice mast design and would require either a reinforced concrete slab foundation or a drilled pier foundation. A reinforced concrete slab foundation can be up to approximately 42 inches thick, covering a 25-by-25-foot area. A drilled pier foundation can be approximately 40 feet deep. An antenna system would be mounted on the tower and oriented for optimal communication with PG&E's control and communication system. The Applicant would construct the switching station; PG&E would construct the electrical connections to its facility. PG&E ultimately would own and operate the switching station and interconnection components.

Together, construction of the substation, switching station, and interconnection facilities would temporarily disturb up to approximately 19 acres; the permanent area of disturbance would be approximately 5 acres for the collector substation and 8 acres for the switching station. The permanent footprint of the substation and switching station would include a graveled parking area for maintenance vehicles. The substation and switching station would be enclosed with a chain-link fence. Appropriate safety signs would be posted along roads and around towers, transformers, and other high-voltage facilities in conformance with applicable regulations.



SOURCE: Avangrid Renewables

Fountain Wind

Figure 2-4b
Preliminary Switching Station and Substation Site Plan

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2.4.4 Other Infrastructure

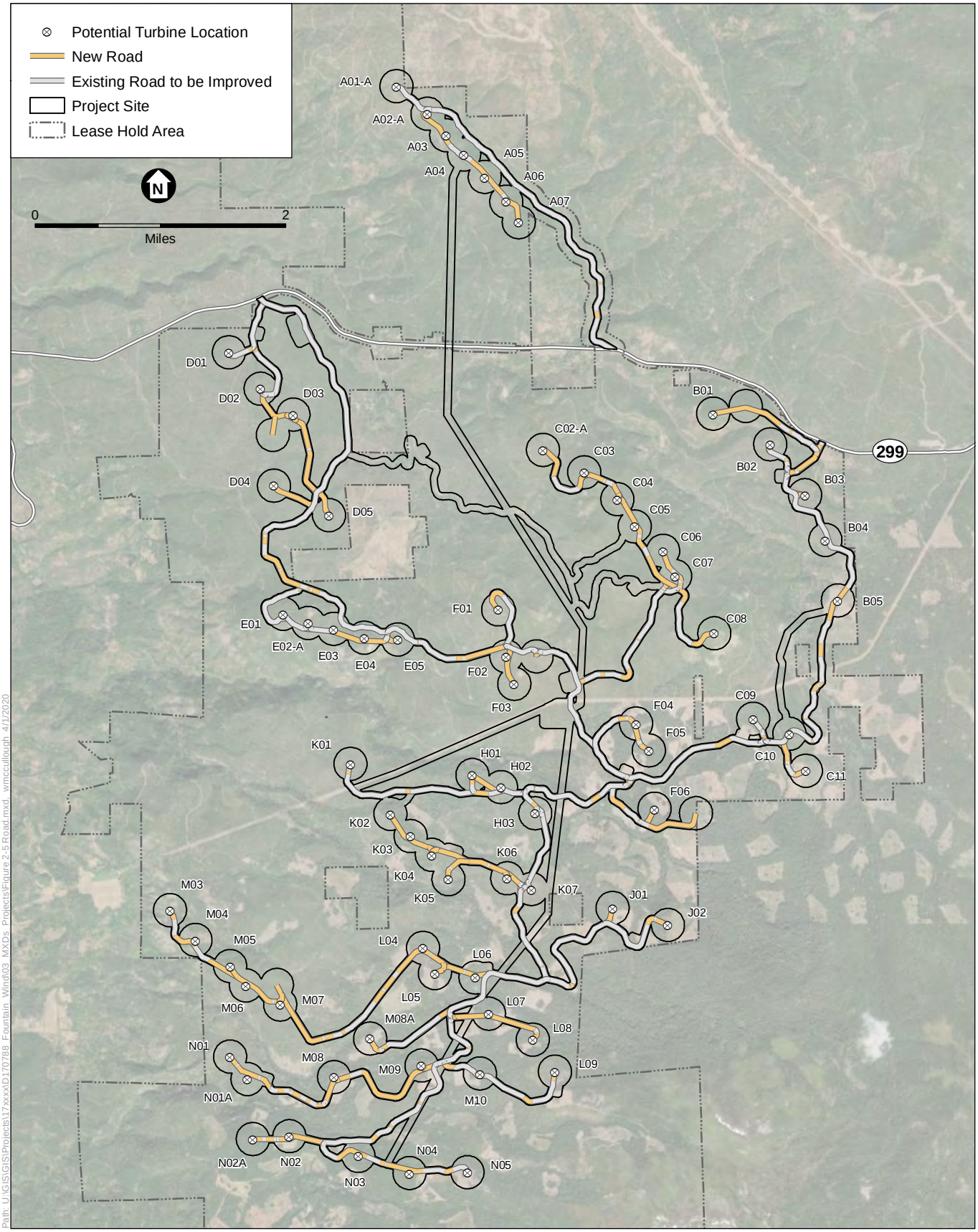
2.4.4.1 Access Roads

The Project Site would be accessed from three existing, gated logging roads located off SR 299 that would remain gated throughout Project construction, operation, and decommissioning. Existing gates may be replaced or reinforced during Project construction. During construction, workers would access the Project Site using the three access points and would park at the O&M facility or at a laydown area. The proposed road system is shown in **Figure 2-5**, *Road Network*. The road layout may be modified as final Project designs are developed to maximize the use of existing roads. Access road cross section details are shown in Figure 7a and Figure 7b of the Initial Study provided as part of the Notice of Preparation package in Draft EIR Appendix J, *Scoping Report*. As new roads are built and existing roads are modified, existing culverts would be replaced as needed with wider, stronger culverts to maintain a functional stormwater drainage system. Drainage improvements would be made in accordance with the Project's erosion control plan pursuant to the National Pollution Discharge Elimination System (NPDES) permit, described in more detail in Section 2.4.5.6, *Stormwater Control*. During operation and maintenance activities, the access roads would continue to be used by service vehicles and equipment.

2.4.4.2 Temporary Construction and Equipment Areas

Construction would require an approximately 10-acre cleared, graded, compacted gravel pad for use as a main construction staging area, to store equipment and materials, host construction trailers, refuel equipment, and store construction waste temporarily (i.e., for up to 14 days). Construction waste would be removed weekly or biweekly by a local waste management entity. This area also would provide temporary parking, construction office space (mobile trailers), and temporary sanitary facilities. A vendor-supplied fuel truck would make daily or weekly deliveries to approved storage tanks, which then would be used to refuel construction vehicles. Fuel tank storage capacity would be determined by the construction contractor. Fuel tanks would be maintained and operated according to all local, state, and federal regulations during construction and operation, and hazardous material storage would be detailed in the Spill Prevention, Countermeasure, and Control (SPCC) Plan described in Section 2.4.8.3, *Hazardous Materials*.

Refueling and general maintenance for construction equipment, such as changing fluids and lubricating parts, would occur within this temporary construction and equipment area or other outdoor locations with sufficient containment capabilities and according to measures outlined in the SPCC Plan. Post-construction, the portions of the staging and laydown area not used for permanent operation and maintenance activities would be restored to preconstruction conditions in accordance with applicable plans, such as a Habitat Restoration Plan, Vegetation Management Plan, and Invasive Species Management Plan. These plans would be developed by the Applicant prior to initiating onsite activities and would outline the procedures to be implemented upon the completion of construction to restore and revegetate areas of temporary disturbance and performance standards to measure revegetation success.



Fountain Wind Project

Figure 2-5
Road Network

Additionally, during construction, 14 two-acre laydown (staging) areas would be located throughout the Project Site to stage building materials and equipment. The final dimensions of each laydown area would be based on site topography and may be graded and compacted or graveled depending on construction needs and soil conditions. Following construction, the laydown areas would be restored in accordance with the Applicant-proposed Habitat Restoration Plan and Vegetation Management Plan within 1 year following the conclusion of construction. Restoration may occur on a rolling basis as construction is completed in the locations served by each laydown area.

2.4.4.3 Operation and Maintenance Facility

A permanent operation and maintenance (O&M) facility, storage yard, and parking area would be located within an approximately 5-acre fenced area near SR 299. See Figure 2-2; see also Figures 8a, 8b and 8c of the Initial Study provided as part of the Notice of Preparation package in Draft EIR Appendix J, *Scoping Report*, which show the proposed O&M facility plan and profile, and Figure 9, which shows a conceptual site plan for the O&M facility. During the Project's operation and maintenance phase, maintenance equipment would be staged in the O&M storage yard. The O&M facility would be served by new or existing domestic wells or water storage tank and an onsite septic system in accordance with the rules and regulations of the Shasta County Department of Resource Management's Environmental Health Division.

2.4.4.4 Meteorological Equipment

Up to four permanent METs would be constructed within the Project Site to measure and record meteorological data to assess the performance of turbines and guide Project operation. These METs would be unguyed and freestanding to minimize impacts on avian species, would be up to 394 feet tall, and would comply with FAA lighting regulations. The Applicant would develop an FAA-approved lighting plan that is expected to specify the installation of flashing red lights on designated METs to improve nighttime visibility.

Mobile meteorological equipment, such as LiDAR and SoDAR systems, also may temporarily be deployed onsite during operation to supplement wind resource data gathered by the permanent METs. No ground disturbance would result from the use of these mobile units.

2.4.5 Site Preparation and Construction

2.4.5.1 Site Preparation

Fencing and Site Security

The Project would be located entirely on private property where public access is currently restricted. The onsite substation would be surrounded by a chain-link fence. Where necessary, safety and "No Trespassing" signs would be posted around towers, transformers, other high-voltage facilities, and along roads in accordance with federal and state regulations. Roads diverging from public access points such as SR 299 would be gated, locked, and setback from SR 299 a minimum 50 feet with a paved apron.

Timber Clearance and Harvesting

Existing commercial and pre-commercial timber would be harvested, treated, and/or removed from the Project Site to allow development of the Project. Areas that would be removed from timber production as a result of the Project would be harvested in accordance with a Timberland Conversion Permit (TCP) and Timber Harvesting Plan (THP) authorization from the California Department of Forestry and Fire Protection (CAL FIRE). The THP would be drafted in accordance with requirements set forth in the Forest Practice Act (Pub. Res. Code §4582) and the Forest Practice Rules (CAL FIRE, 2019), would be prepared by a Registered Professional Forester, and would be carried out by licensed timber operators. The THP would specify the location of timber to be harvested, how it would be harvested, and environmental best management practices (BMPs) that would be implemented during harvesting. The Applicant would provide the County with written documentation of CAL FIRE's approval of the THP prior to the commencement of onsite activities.

Ground-Disturbing Activities

Construction would include ground-disturbing activities such as clearing and grubbing, topsoil stripping, grading, compaction, utility trenching, soil borings, well-drilling, and the placement of turbine foundations and pads and aggregate surfacing. Grading activities would include the removal, storage, and disposal of soil, gravel, vegetation, organic matter, loose rock, and debris. Native soil excavated in one part of the Project Site would be used as fill in another area to minimize soil import and export. Cut and fill dimensions would be finalized along with engineering designs. Project disturbance areas that would be subject to ground disturbance as a result of these activities are summarized in Table 2-1.

Blasting may be necessary to loosen rock before excavation. If blasting is necessary, the Applicant would prepare a Blasting Plan that identifies the locations where blasting is anticipated to be needed and all applicable regulations for blasting procedures. The Blasting Plan also would specify the times and distances where explosives would be permitted to avoid impacts on sensitive environmental receptors and the human environment. The County and emergency responders would be notified at least 24 hours in advance of blasting. All blasting activities would be conducted in compliance with applicable federal, state, and local laws, and appropriate safety and environmental protection measures would be implemented, including weather restrictions in regards to wildfire risk.

Road Construction and Improvement

The Project Site would be accessed via existing, gated logging roads located off of SR 299. Existing gates may be replaced or reinforced and the roads may be graveled. During construction, new internal access roads would have a 40-foot-wide driving surface plus a 20-foot construction buffer on either side, resulting in an approximately 80-foot-wide disturbance area. In some areas, the construction cleared area could be up to 200 feet wide to accommodate significant cut and fill, stormwater controls, road design, and blade-delivery-vehicle turning radii. New road surfaces would be graded and graveled. The existing logging road network within the Project Site would be widened and modified according to the aforementioned specifications to safely accommodate turbine component delivery vehicles and heavy equipment. Road widening details are provided in

Table 2-1, *Project Components and Disturbance Areas*. Fugitive dust control would include application of appropriate dust suppressants, such as water or surfactants, as necessary during construction.

As new roads are built and existing roads are modified, existing culverts would be upgraded or replaced as needed to maintain a functional stormwater drainage system and meet fire safety and access standards. Individual crossings and culverts would follow appropriate BMPs and comply with all applicable independently enforceable requirements of the U.S. Army Corps of Engineers and California Department of Fish and Wildlife (CDFW) for in-stream activities, including CDFW requirements relating to fish passage. Drainage improvements would be made in accordance with the Project's erosion control plan pursuant to the NPDES permit described in Section 2.4.5.6, *Stormwater Control*.

During operation, access roads would continue to be used by service vehicles and equipment for maintenance activities. After construction, permanent access roads would be reduced to a 20-foot driving surface with a 1-foot shoulder. An additional 10 feet on either side may be required in some areas to accommodate stormwater drainage. Permanent access roads would be periodically graded and compacted to minimize erosion. Catch basins, roadway ditches, and culverts would be cleaned and maintained regularly. Permanent access roads would be used both for Project operation and continued timber management, and the Project operator and timber operator would share responsibility for maintaining these areas. Maintenance would be done at a frequency dictated by environmental conditions onsite.

Domestic Well Installation

New water wells may be required during construction and operation. Domestic well installation, if determined by the Applicant to be needed or desirable for Project purposes, would occur at the location of the proposed O&M facility and be performed using typical truck mounted drilling equipment and in accordance with the rules and regulations of the Shasta County Department of Resource Management's Environmental Health Division (Shasta County EHD, 2019). The number of new wells to be installed would be determined based on an agreement with the landowner. Alternatively, the Burney Water District could supply domestic water to serve Project needs. The Project's estimated water demand is discussed in Section 2.4.8.1, *Water and Wastewater*.

2.4.5.2 Construction Sequence

Initial construction activities would include widening existing access roads and constructing new access roads. Temporary staging and laydown areas also would be established to store turbine components and other Project equipment. A 5-acre area would be cleared around each turbine location to create a crane pad, construction laydown area, and rotor assembly area. Once turbine foundations are constructed, the turbines would be assembled and erected using forklifts and cranes. Construction of the substation, underground and overhead collection system, and O&M building would be concurrent with turbine installation. Upon the conclusion of construction, final testing would begin to ensure that all systems are functioning properly. As construction activities are completed, temporary staging and laydown areas would be restored to preconstruction conditions. As part of a final site cleanup, all waste materials would be removed from the Project Site.

Throughout construction, all construction activities would be implemented consistent with NPDES permit requirements and the Storm Water Pollution Prevention Plan (SWPPP) and Temporary Erosion and Sediment Control (TESC) Plan described in Section 2.4.5.5, *Stormwater Control*.

2.4.5.3 Materials Delivery

Delivery of Project components would be coordinated through the California Department of Transportation (Caltrans) and County encroachment permit processes and timed to minimize traffic disruptions. These permit processes would determine final trailer configuration, clearance requirements, emergency service access, lane closures (if necessary), California Highway Patrol escort (as required), and transportation times. For purposes of this analysis, all materials would be delivered to the Project Site by truck.

Turbines. Delivery plans would be finalized once a final turbine model and supplier is selected. In general, towers are expected to be delivered in three to six sections. Turbine components such as blades, nacelles, rotors, controllers, ladders and platforms, pad-mounted transformers, pad-mounted transformer vaults, and turbine switchgear would be delivered separately. Up to 15 separate delivery loads would be needed for each turbine. Of these, eight or nine deliveries would be classified as oversize according to California Vehicle Code Division 15, *Size, Weight, and Load*, for highway transportation, and would require oversize vehicle permits and/or variances[7] from Caltrans. Turbine component delivery vehicles would generally conform to road weight limits, and any deviations from these weight limits would be specified in oversize permit applications submitted to Caltrans. Additionally, cranes used to assemble turbine components would be delivered in multiple loads and assembled onsite.

Aggregate. Up to three temporary concrete batch plants (each between 3 and 5 acres) may be located within the onsite temporary construction and equipment area to facilitate cement delivery for foundations. Aggregate is expected to be sourced locally from the Burney area, but could be supplied from as far away as Redding. The batch plants would be removed following construction. Each batch plant would require a stand-alone generator as well as fuel, aggregate, cement, and water for operation. Stockpiles of sand and aggregate, which would be delivered by truck, would be located near each batch plant in a location that would minimize exposure to wind. Cement would be discharged via screw conveyor directly into an elevated storage silo without outdoor storage. The construction managers and crew would use BMPs and standard operating procedures to keep the plant, storage, and stockpile areas clean and to minimize the buildup of fine materials that could result in fugitive dust or offsite sedimentation.

Project construction is anticipated to generate approximately 12,070 total material delivery truck trips (east and west combined), or an average of 124 material delivery truck trips per day. Material delivery trucks could carry aggregate, turbine-related components, concrete, water, and other construction-related materials (**Appendix H**, *Transportation*). The Applicant anticipates that the bulk of materials would be delivered by truck from locations no more than 50 miles from the Project Site. Prior to arrival onsite, large components such as turbine blades are likely to be delivered by truck, barge, or rail to existing regional storage yards.

[7] Variances would be required for oversized loads, i.e., those with a width over 15 feet and/or length over 135 feet.

2.4.5.4 Construction Equipment

Equipment types and use assumptions by phase to construct the Project are identified in **Table 2-2**, *Construction Equipment List*.

TABLE 2-2
CONSTRUCTION EQUIPMENT LIST

Phase	Workdays	Equipment Type	Number	Hours/day
Timber Removal and Grubbing	80	Feller Buncher (logging)	2	8
		Logging Trucks	8	8
		Skidder	2	8
		Pickups	8	8
		Hydro Axe	2	8
Grading and Access Road Work	160	Road Grader	3	8
		Scraper	4	8
		Bulldozer (medium)	6	8
		Drum Compactor	4	8
		Rock Trucks	8	8
		Pickups	16	8
		Water Truck	6	8
Concrete Batch Plants	70	Concrete Pump Truck	2	8
		Mixer	10	8
		Generator	3	8
		Skid Steer Loader	3	8
		Pickups	6	8
		Water Truck	3	8
Turbine, Transformer, Substation, and O&M Foundations	70	Excavator	3	8
		Bulldozer (medium)	3	8
		Drum Compactor	4	8
		Skid Steer Loader	3	8
		Pickups	10	8
		Mobile Hydraulic Crane	3	4
Turbine and Transformer Installation	100	Mobile Hydraulic Crane	6	4
		Bulldozer (medium)	2	8
		Rubber Tired Forklifts	10	8
		Large Crawler Crane	4	8
		Pickups	20	8
		Turbine Delivery Vehicles	8	8
		Generator	4	8
Substation and O&M Building Installation	160	Mobile Hydraulic Crane	2	4
		Skid Steer Loader	2	8
		Pickups	8	8
		Rubber Tired Forklift	3	8

TABLE 2-2 (CONTINUED)
CONSTRUCTION EQUIPMENT LIST

Phase	Workdays	Equipment Type	Number	Hours/day
Underground Collector System	140	Trenching Equipment	4	8
		Rubber Tired Forklift	4	8
		Pickups	12	8
		Bulldozer (medium)	1	8
		Skid Steer Loader	4	8
Overhead Collection System	100	Backhoe Loader (includes setting collector system poles)	4	8
		Cable Reel Truck (includes auger for pole foundations)	3	8
		Mobile Hydraulic Crane	2	4
		Pickups	10	8
		Bulldozer (medium)	1	8
		Boom Lift	6	4
	5	Helicopter	1	8
Substation Aggregate and Security Fence	15	Skid Steer Loader	1	8
Transmission Line Connection	20	Mobile Hydraulic Crane	6	4
		Cable Reel Truck (includes auger for pole foundations)	4	8
		Boom Lift	6	4
		Pickups	8	8
		Bulldozer (medium)	1	8
		Excavator	2	8
	1	Helicopter	1	8

SOURCE: Fountain Wind, 2020, with revisions to use hours per day to reflect equipment operator breaks, etc., during the 10-hour workday.

2.4.5.5 Construction Schedule and Workforce

Project construction is expected to last 18 to 24 months. Generally, construction would occur during daylight hours from 7 am to 5 pm but could vary during summer or winter months, to accommodate specific construction needs or site conditions, to avoid traffic or high winds, or to facilitate the Project schedule. The Project would require up to 400 workers, some of whom would be local workers, and others would be specialized workers that may reside outside the local area. Non-local workers would stay at local hotels and commute to the Project Site. No new temporary worker lodging is expected to be constructed as part of the Project. Workers would most likely commute from Redding, Burney, Fall River Mills, or McArthur (**Appendix H**).

2.4.5.6 Stormwater Control

To minimize impacts on drainage and runoff, the Project would maintain onsite surface drainage patterns to the extent possible. Newly-constructed access roads would be designed to follow natural contours and minimize hill cuts. Ditches and culverts would be incorporated into road design to capture and convey storm water runoff. Except in areas where permanent recontouring is required, disturbed areas would be restored to preconstruction conditions.

In accordance with the Construction General Permit (USEPA, 2017), the Applicant would prepare a site-specific SWPPP for the Project that would identify BMPs to be used to minimize or eliminate pollution, erosion, and sedimentation. The Applicant also would prepare a TESC Plan, which would be implemented and maintained by the construction contractor throughout operation to further reduce the potential for erosion. Measures included in the TESC Plan would be comparable in effect to those described by the Center for Environmental Excellence by the American Association of State Highway and Transportation Officials (AASHTO, 2019).

2.4.6 Operation and Maintenance

Although upgrading and replacing equipment could extend the operating life of the wind energy facility indefinitely, for CEQA purposes, the life of the Project would be coterminous with the term of the use permit that is required for its operation, i.e., 40 years.

The Applicant would prepare a Project-specific Fire Prevention Plan (FPP) prior to the commencement of onsite activities that would remain in place for the life of the Project. The FPP would include procedures for emergency response, evacuation, fire agency notification, and fire prevention. Tree removal and maintenance of fire breaks also would be disclosed in the CAL FIRE TCP and THP. The FPP also would require the Applicant's and construction contractors' vehicles and personnel to be equipped with fire suppression equipment, radio and cellular access, and pertinent telephone numbers for reporting a fire. The Applicant's FPP would be prepared consistent with the directives in the Shasta County Fire Safety Standards (Shasta County, 2017), the Forest Practice Rules (CAL FIRE, 2019), and CAL FIRE's Shasta–Trinity Unit Strategic Fire Plan (CAL FIRE, 2017).

Project operation would require up to 12 full-time employees. Operation and maintenance activities would occur from Monday to Friday during normal working hours. The Project operator would monitor turbines through the SCADA monitoring system 24 hours a day, seven days a week. This system would allow the Applicant to perform self-diagnostic tests and would allow a remote operator to perform system checks, establish operating parameters, and ensure that the turbines are operating at peak performance. In the event of winds, gusts above the maximum operating parameters or red flag alerts, the turbines would automatically shut down.

Maintenance of turbines and associated infrastructure includes a wide variety of activities. The Applicant would develop an O&M protocol to be implemented throughout Project operation. This protocol would specify routine turbine maintenance and operation in accordance with the maintenance requirements prescribed by the turbine manufacturer. Some unscheduled maintenance and repair would be necessary. Routine maintenance activities are expected to include, but not be limited to: checking torque on tower bolts and anchors; checking for cracks and other signs of stress on the turbine tower and other turbine components; inspecting for leakage of lubricants, hydraulic fluids and other hazardous materials, and replacing them as necessary; inspecting the grounding cables, wire ropes and clips, and surge arrestors; cleaning; and repainting. Most routine maintenance activities would occur within and around the tower and the nacelle. Cleanup from routine maintenance activities would be performed at the time

maintenance is performed. While performing most routine maintenance activities, O&M staff would travel via pickup or other light-duty trucks.

Scheduled maintenance activities would include servicing the turbines twice a year or as needed, and may require the use of a crane within the 65- to 95-foot diameter maintained areas around the turbines. Turbine servicing would require maintenance staff to climb towers and service turbine parts by performing activities such as removing the turbine rotor and replacing generators and bearings. Project operation would require utility vehicles, cranes, and other equipment for Project maintenance activities. Non-routine maintenance such as repair or replacement of rotors or other major components, if needed, could involve use of one or more cranes and equipment transport vehicles. Permanent access roads would be periodically graded and compacted in order to minimize erosion. Catch basins, roadway ditches, and culverts would be cleaned and maintained regularly.

2.4.7 Decommissioning and Site Restoration

Proposed decommissioning of existing facilities and infrastructure and restoration of the Project Site would require approximately 18 to 24 months. Decommissioning refers to the dismantling and removal of the Project's facilities, including power generation equipment. Removal of turbine components and related infrastructure would include dismantling the turbines, support towers, transformers, substation, switching station, and foundations; excavating them to a depth of approximately 3 feet below grade; and removing them from the Project Site to be reused, recycled, or sold. Some roads no longer needed to access turbines, e.g., once turbines have been dismantled and removed, would be allowed to naturally revegetate. If a domestic well(s) is installed as described in Section 2.4.4.3, it would remain onsite. Underground collection and communication cables would be abandoned in place.

The types of equipment, vehicles, and workforce necessary to decommission the Project would be generally similar to the requirements for construction, except considerably less intensive in that no concrete batch plant(s), cable delivery, or concrete trucks would be required, and no cable trenching or similar work would occur. Moreover, existing service roads would be used; no new access roads or road widening would be required. All management plans and BMPs developed for Project construction also would apply during the decommissioning phase of the Project.

Site restoration refers to recontouring and revegetating the site upon completion of the Project's operational life to be as similar to preconstruction conditions as possible. In coordination with the land owner, disturbed areas would be replanted with trees or other appropriate vegetation. The goal of site revegetation would be to develop a vegetation cover, composition, and diversity similar to the area's ecological setting and consistent with the landowner's current and future land use practices.

Prior to operation of the Project, the Applicant would prepare a Draft Decommissioning Plan that details a restoration plan and how Project facilities and infrastructure would be removed. The Draft Decommissioning Plan would be revised and finalized prior to Project operations. The Applicant or its contractor would implement the Final Decommissioning Plan upon cessation of

Project operations. The Final Decommissioning Plan would include plans and procedures for facility dismantling and removal, disposal and recycling, site restoration, and habitat restoration and monitoring and would be developed in compliance with standards and requirements at the time of site decommissioning. The Director of Resource Management would review and approve the Final Decommissioning Plan. The applicant would be required to annually estimate the cost of decommissioning based on a scenario where it is necessary to implement the Final Decommissioning Plan as a public works project. The applicant would also be required to post and update a financial assurance mechanism to cover the cost of the annual decommissioning cost estimate. Both the annual estimate and financial assurance mechanism would be reviewed and approved by the Director of Resource Management in a manner similar as is carried out for reclamation plans concerning mining operations throughout the County.

2.4.8 Water, Wastewater, Waste, and Hazardous Materials

2.4.8.1 Water and Wastewater

Project construction and long-term operation includes the use of potable water from one or more new onsite water supply wells to be drilled at the O&M facility location or from the importation of water by truck from the Burney Water District, which is located approximately 6miles east-northeast of the Project Site. Any wells installed onsite would be constructed in accordance with the rules and regulations of the Shasta County Department of Resource Management's Environmental Health Division. A Water Supply Assessment has been prepared for the Project in accordance with Water Code requirements. A copy is provided in **Appendix I**.

Project construction would require up to 49 acre-feet of water for dust control, soils compaction, and concrete manufacture, emergency fire suppression, and other activities. Out of the 12,070 total material delivery trips, approximately 1,338 truck trips (each way) are estimated for the delivery of water during construction.

Operation and maintenance of the Project would require up to 5.6 acre-feet of water per year (approximately 5,000 gallons per day) for vehicle and equipment washing and maintenance, potable water supplies for 12 full-time employees, and water storage to meet Shasta County fire flow requirements.[8] Water for the O&M building would be supplied either by an onsite well or by a storage tank located at the O&M building that periodically (e.g., monthly) would be filled by a water truck. No additional permanent water tanks are proposed to be installed as part of the Project. Water use during decommissioning and site restoration would be limited to use for fire protection and dust suppression.

During construction, portable toilets would be provided for the construction workforce. These facilities would be serviced on a regular basis by a contractor who would dispose of sanitary wastewater pursuant to applicable regulations. Wastewater from the O&M facility would be processed using an onsite septic system.

8 Fire flow requirements may be found in the Shasta County Code of Ordinances, Title 16 Buildings and Construction, Chapter 16.04.130 Fire Standards and Equipment (Ordinance No. 2019-06 [2019]) and the 2019 California Fire Code (24 Cal. Code Regs. Part 9).

2.4.8.2 Waste

During construction, approximately 10,000 pounds of solid waste would be generated per week. Construction debris (e.g., scrap lumber and metal) and operational debris (e.g., office waste and some paper waste) would be collected by either the construction contractor or Burney Disposal Inc. Waste would be transported to the Burney Transfer Station and ultimately disposed of or recycled at the Anderson Landfill in accordance with federal, state, and local solid waste regulations. Decommissioning and restoration would generate the same amount of solid waste as the construction phase (10,000 pounds per week). The Applicant would handle and dispose of solid waste in accordance with all regulatory requirements and would implement standard BMPs with regard to solid waste.

2.4.8.3 Hazardous Materials

Table 2-3, *Hazardous Materials*, depicts the types, uses, and quantities of hazardous materials that are expected to be used during the site preparation and construction, operation and maintenance, and decommissioning and site restoration phases of the Project.

During all Project phases, activities may involve the transportation, use, or storage of a variety of hazardous materials, including batteries, hydraulic fluid, diesel fuel, gasoline, propane, antifreeze, dielectric fluids, explosives, herbicides, grease, lubricants, paints, solvents, and adhesives.

In accordance with requirements contained in the Health and Safety Code and the California Code of Regulations, the Applicant would prepare a Hazardous Materials Business Plan/Spill Prevention Control and Countermeasures Plan (HMBP/SPCC) prior to construction. The HMBP would include BMPs for the transport, storage, use, and disposal of hazardous materials and waste. The HMBP also would include information regarding construction activities, worker training procedures, and hazardous materials inventory procedures. Prior to operation, the Applicant would update the HMBP (including the BMPs) with information about the types of hazardous materials that would be used during operation. The HMBP/SPCC would comply with the requirements of these federal, state, and local requirements (see, e.g., 40 CFR Part 112).

During construction, waste disposal and collection receptacles would be located onsite to ensure proper disposal of hazardous materials. Operation and maintenance of the Project would not require as many hazardous materials as construction or decommissioning. During operation, hazardous materials would be stored in the O&M facility and storage sheds. Nonhazardous batteries would be stored at the substation. Monthly inspections of each of these facilities would occur to check for leaks and spills.

During construction, operation, and decommissioning, all fuels, waste oils, and solvents would be collected and stored in tanks or drums within a secondary containment area consisting of an impervious floor and bermed sidewalls. Fuel would be stored in aboveground storage tanks. These tanks may have either a double wall or would be placed within temporary, lined, earthen berms for spill containment. Upon the conclusion of construction and decommissioning phases, excess fuels would be removed from the site and any surface contamination resulting from fuel handling operations would be remediated.

TABLE 2-3
HAZARDOUS MATERIALS

Hazardous Material	Uses	Typical Quantities
Diesel[a]	Fuel for construction and transportation equipment during construction and decommissioning. Used to power an emergency generator during operation, if needed.	Over 5,000 gallons would be stored in aboveground tanks during construction and operation. The amount of diesel to be stored onsite during decommissioning is unknown at this time but is assumed be similar to that of construction.[b]
Gasoline	Some construction equipment and transportation vehicles.	Gasoline would not be stored onsite during any phase of the Project.
Propane[a]	Ambient heating of the O&M building.	Approximately 500 to 1,000 gallons stored in an aboveground propane storage vessel.
Lubricating oils/ grease/hydraulic fluids/gear oils	Lubricating oil would be present in some turbine components, in the diesel engine of the emergency generator, and in engines of construction and transportation equipment.	Limited quantities would be stored in portable containers (capacity of 55 gallons or less) and maintained onsite during all phases of the Project.
Glycol-based antifreeze	Used in wind turbine components for cooling (approximately 5 to 10 gallons are present in the cooling system for the transmission. Used in the diesel engine for the emergency generator.	Limited quantities (10 to 20 gallons of concentrate) would be stored onsite during each phase of the project.
Lead-acid storage batteries and electrolyte solution	Present in construction and transportation equipment. Backup power source for control equipment, tower lighting, and signal transmitters.	Limited quantities of electrolyte solution (<20 gallons) for maintenance of construction and transportation equipment during construction and decommissioning.
Other batteries (e.g., nickel-cadmium batteries)	Used in some control equipment and signal-transmitting equipment.	These batteries would not be maintained onsite.
Cleaning solvents	Organic solvents would be used for equipment cleaning and maintenance when water-based cleaning and degreasing solvents cannot be used.	Limited quantities or organic solvents (<55 gallons) would be stored onsite during construction and decommissioning to maintain construction and transportation equipment. Limited quantities (<10 gallons) of water-based cleaning solvents would be stored onsite during operation.
Paints and coatings[c]	Used for corrosion control on exterior surfaces of turbine towers.	Limited quantities would be used for touch-up painting during construction (<50 gallons) and for maintenance during operations (<20 gallons).
Dielectric fluids[d]	Used in electrical transformers, bushings, and other electric power management devices as an electrical insulator.	Some transformers may contain more than 500 gallons of dielectric fluid. Onsite transformers each contain approximately 10,000 gallons of mineral oil.
Explosives	May be necessary for excavation of tower foundations in bedrock or creating construction access, onsite roads, or grade alterations.	Limited quantities necessary to complete the task would be stored onsite. Onsite storage is expected to occur only for limited periods of time and as needed for specific construction activities.
Herbicides	May be used for vegetation control around facilities for fire safety.	If deemed necessary, herbicides would be brought to the site and applied by a licensed applicator.

NOTES:

[a] Diesel fuel and propane would be replenished onsite by commercial vendors as necessary.

[b] These values represent the total onsite storage capacity, not the total amount of fuel which would be consumed during Project construction.

[c] It is presumed that all wind turbine components, nacelles, and support towers would be painted at their respective points of manufacture. No wholesale painting would occur onsite; only limited amounts would be used for touch-up purposes during construction and maintenance phases. It is assumed that the coatings applied by the manufacturer during fabrication would be sufficiently durable to last throughout the equipment's operational period and that no wholesale repainting would occur.

[d] It is assumed that the majority of transformers, bushings, and other electrical devices that rely on dielectric fluids would have those fluids added during fabrication and would not require dielectric fluid to be added onsite. It is assumed that servicing of electrical devices that involves wholesale removal and replacement of dielectric fluids would not occur onsite and that equipment requiring such servicing would be removed from the site and replaced. New transformers, bushings, or electrical devices are expected to contain mineral oil-based, or synthetic dielectric fluids that are free of polychlorinated biphenyls. Some equipment may instead contain gaseous dielectric agents (e.g., sulfur hexafluoride) rather than liquid dielectric fluids.

SOURCES: Stantec, 2018 (in Draft EIR Appendix J); ConnectGen, 2019.

All equipment (particularly equipment operating in or near a drainage or in a basin) would be maintained in good working condition, and free of leaks. All vehicles would be equipped with drip pans during storage to contain minor spills and drips. No refueling or storage would take place within 100 feet of a drainage channel or other sensitive resource. Spill kits would be located onsite and in vehicles for use in spill response. In addition, all maintenance crews working with heavy equipment would be trained in spill containment and response.

2.5 Description of Alternatives

CEQA requires a lead agency to analyze a reasonable range of alternatives to a proposed project that could feasibly attain most of the basic objectives of the project while substantially reducing or eliminating significant environmental effects. CEQA also requires an EIR to evaluate a "no project" alternative to allow decision-makers to compare impacts of approving a project with the impacts of not approving it. This section describes the key considerations used to identify and screen potential alternatives, explains why some potential alternatives were eliminated from further consideration, and describes the alternatives that were carried forward for additional analysis.

2.5.1 Alternatives Development and Screening

The County screened and thereafter selected alternatives to be discussed based on the following key provisions of the CEQA Guidelines (14 Cal. Code Regs. §15126.6):

- The discussion of alternatives shall focus on reasonable, feasible alternatives to the proposed project or its location that are capable of avoiding or substantially lessening any significant effects of the proposed project, even if these alternatives would impede to some degree the attainment of the proposed project objectives, or would be costlier.
- The No Project Alternative shall be evaluated, along with its impacts. The no project analysis shall discuss the existing conditions at the time the notice of preparation was published, as well as what would be reasonably expected to occur in the foreseeable future if the proposed project were not approved, based on current plans and consistent with available infrastructure and community services.
- The range of alternatives required in an EIR is governed by a "rule of reason," meaning the EIR must evaluate only those alternatives necessary to permit a reasoned choice.
- An EIR need not consider an alternative whose effects cannot be reasonably ascertained and whose implementation is remote and speculative.

The range of feasible alternatives is selected and discussed in a manner to foster meaningful public participation and informed decision making. Among the factors that may be taken into account when addressing the feasibility of alternatives (as described in CEQA Guidelines §15126.6[f][1]) are environmental impacts, site suitability, economic viability, social and political acceptability, technological capacity, availability of infrastructure, general plan consistency, regulatory limitations, jurisdictional boundaries, and whether the proponent could reasonably acquire, control, or otherwise have access to an alternative site.

Among the factors that may be considered in determining not to carry a potential alternative forward for more detailed consideration in an EIR are:

1. Whether the alternative would meet most of the basic project objectives. Section 2.3, Project Objectives, identifies nine Project objectives. Of these, the County has determined the following to be the "most basic" project objectives: Provide up to 216 MW of wind energy to PG&E's Northern California grid, create temporary and permanent jobs in the County, and contribute to the County's tax base. Any alternative determined not to meet these most basic of the Project objectives was not carried forward for more detailed review.

2. Whether it would be "feasible," where feasible means capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors (Pub. Res. Code §21061.1; CEQA Guidelines §§15126.6, 15364). Any alternative determined to be infeasible was not carried forward for more detailed review.

3. Whether it would be able to avoid or substantially lessen any of the potentially significant impacts of the Project. The County used a liberal definition of "potentially significant" at the outset of the CEQA process that was informed in part by the Scoping Process to identify resource areas where the Project could have a potential to cause significant impacts. The results of this initial inquiry are provided in **Table 2-4**, Preliminary Summary of Potentially Significant Environmental Impacts. Any alternative determined not to avoid or substantially lessen the potential impacts identified in Table 2-4 was not carried forward for more detailed review.

4. Whether its implementation is remote or speculative. Any alternative determined to be remote or speculative was not carried forward for more detailed review.

TABLE 2-4
PRELIMINARY SUMMARY OF POTENTIALLY SIGNIFICANT ENVIRONMENTAL IMPACTS

Issue Area	Impact - Would the alternative reduce potential project impacts on:
Aesthetics	• Daytime and nighttime views of the proposed turbines, overhead power lines, and areas cleared for Project purposes?
Air Quality	• Increased PM10 emissions in a region of non-attainment for the PM10 state ambient air quality standard?
Biological Resources	• Wildlife species including birds and bats that inhabit, nest in, pass or migrate through, or forage within the Project Site? • Forest habitat, including fragmentation and edge effects? • Aquatic habitats (e.g., lakes, streams, and associated riparian habitats, including wetlands) from erosion?
Hydrology and Water Quality	• Sources of drinking water from erosion or hydrologic disruption? • The water quality of headwaters and surface waters for: Hatchet Creek, Montgomery Creek, the South Fork of Montgomery Creek, Goat Creek, Indian Springs, Willow Creek, Cedar Creek, Blue Lake, Little Cow Creek, the North Fork of Little Cow Creek, Mill Creek, Cheddar Creek, Sawdust Creek, and Buffum Creek from erosion or other contamination?
Transportation Emissions/Noise	• Vehicle-emissions-related air quality, and noise due to anticipated delays on SR 299 during materials delivery?
Tribal Cultural Resources	• The viewshed of Yet-Tey-Cha-Na (Lassen Peak) and Kohm Yamani (Snow Mountain), which are held sacred by the Pit River Tribe and Tribal members? • The ridgetop trail identified by the Tribe and its members during scoping and as shown on General Land Office Maps? • Birds traditionally important to the Pit River culture (e.g., eagles and eagle nests, osprey, ducks, and geese)? • Audible and physical disruption of an area identified by Native Americans as culturally significant?

CEQA also makes clear that an EIR must include "sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the Project" (CEQA Guidelines §15126.6[d]). This EIR considers three alternatives to the Project. The No Project Alternative is described in Section 2.5.3.1; Alternative 1, *South of SR 299*, is described in Section 2.5.3.2; and Alternative 2, *Increased Setbacks*, is described in Section 2.5.3.3.

2.5.2 Alternatives Rejected from Detailed Consideration

2.5.2.1 Off-site Alternatives

Scoping comments suggested that the County consider off-site alternatives, including replacing the current proposal with an off-shore wind facility or with an on-shore facility far from the proposed site. Specific recommendations for more distant locations included Modoc County, Tehama County, Contra Costa County's Altamont Pass, Kern County's Tehachapi Pass, and Riverside County's San Gregorio Pass. However, off-site alternatives were not carried forward for more detailed consideration.

CEQA does not expressly require a discussion of alternative project locations (Pub. Res. Code §§21001[g], 21002.1[a], and 21061). CEQA Guidelines Section 15126.6(a) requires a description of "a range of reasonable alternatives to the project, or to the location of the project," suggesting that a lead agency may evaluate onsite alternatives, off-site alternatives, or both. For the Fountain Wind Project, the County has elected (consistent with CEQA) to evaluate only onsite alternatives. As the California Supreme Court has emphasized, "the keystone of regional planning is consistency—between the general plan, its internal elements, subordinate ordinances, and all derivative land-use decisions. Case-by-case reconsideration of regional land-use policies, in the context of a project-specific EIR, is the very antithesis of that goal." *Citizens of Goleta Valley v. Board of Supervisors* (1990) 52 Cal. 3d 553, 572–73. Because the land use and planning provisions that govern use of the proposed site contemplate potential wind energy use (Shasta County Code of Ordinances §17.08.030), the County has elected not to reconsider those determinations in the context of this EIR and instead is focusing on whether an environmentally superior version of the Project exists within the Project Site. This approach is consistent with the court's conclusion in *Mira Mar Mobile Community v. City of Oceanside* (2004) 119 Cal. App.4th 477, 492 ("Because the proposed project is consistent with the City's existing plans, policies and zoning, we conclude a review of alternative sites was not necessary.")

2.5.2.2 Repowering Alternative

Scoping comments suggested as an alternative to the Project that the Applicant repower one or more of its existing wind facilities, including Dillon, Tule Wind, Phoenix Wind, Manzana Wind, Mountain View III, and Shiloh. Information about each of these past projects is provided in **Table 2-5**, *Repowering Alternative Options*.

The potential Repowering Alternative was not carried forward for more detailed consideration for the same reasons the potential off-site alternatives were not (see Section 2.5.2.1).

TABLE 2-5
REPOWERING ALTERNATIVE OPTIONS

Project	Megawatts	Location
1. Dillon Wind	45	San Gorgonio Pass (Riverside County and the City of Palm Springs)
2. Phoenix Wind	2.1	Riverside County
3. Mountain View III	22.4	Riverside County
4. Tule Wind	131	San Diego County
5. Manzana Wind	189	Kern County
6. Shiloh Wind	505	Solano County

SOURCES: BLM, 2012; CEC, 2019a; EDF Renewables, 2019; Renewable Energy World, 2014; USGS, 2019a, 2019b.

The County elected not to carry a repowering alternative forward for additional, separate and independent reasons as well. For example, projects 1, 2, 3, 4, and 5, as identified in Table 2-5, were not carried forward for more detailed review because they would not meet the basic objectives of the Project because they would not provide 216 MW of wind energy to PG&E's Northern California grid (NP15) and would not create temporary or permanent jobs within the County: Projects 1 through 4 are located in Riverside and San Diego counties, which are not part of NP15 and are not in PG&E's electric service territory (PG&E, 2014); and project 5 was recently commissioned and does not provide sufficient capacity to meet the basic objectives of the Project. Project 6, as identified in Table 2-5, already is the largest re-powering project in the United States and also is not a current candidate for repowering: Shiloh Wind, originally installed in 1989, was repowered in four phases between 2005 and 2012 (CEC, 2019c). Research from the National Renewable Energy Laboratory (NREL) indicates that wind projects "less than 20 years old are expected to be capable of generating a favorable revenue stream for several more years" (Lantz et al., 2013). Because of where that project is in its overall "lifespan," repowering it was not carried forward for more detailed consideration. Finally, none of the six projects are owned or controlled by the Applicant or the County and thus neither has the legal means or right to repower them.

2.5.2.3 Alternative Technologies

Hydroelectric Power

Members of the public suggested during the scoping process that the County consider a hydroelectric power alternative to the Project. Several private hydroelectric projects are located in Shasta County. Of them, those that ring the Project Site to the north, west, and south include: H0240 Burney Creek (3 MW), H0321 Hatchet Creek (7 MW), H0168 Montgomery Creek (2.6 MW), H0271 Kilarc (3 MW), and H0507 Bear Creek (3.2 MW) (CEC, 2015; CEC, 2019b). The largest private hydroelectric projects in Shasta County are both on the Pit River: H0250 James B. Black (172 MW) and H0393 Pit 7 (112 MW) (CEC, 2015). Two federal hydroelectric projects also are located in Shasta County: Shasta Dam and Keswick Dam, both are U.S. Bureau of Reclamation public works projects that cross the Sacramento River. The Shasta Dam is capable of generating 710 MW (U.S. Bureau of Reclamation, 2020a); the Keswick Dam has capacity to generate 105 MW (U.S. Bureau of Reclamation, 2020b).

The County initially considered a hydroelectric power alternative, but did not carry it forward for more detailed review because it would not meet the basic objectives of the Project of providing up to 216 MW of wind energy. The largest of the existing private hydropower facilities in the County produces less than 80 percent of the proposed nameplate capacity of the Project. Further, the most significant waterways within the Project Site (i.e., the north and south forks of Montgomery Creek and Little Cow Creek) are much smaller and would not have the same generating capacity as the Pit River, where the two largest existing private hydropower projects are located, or the Sacramento River, where the two federal hydropower projects are located.

A hydropower alternative also has not been carried forward for detailed review because its feasibility would be speculative: while the potential alternative would avoid the potential significant aesthetic impact of the Project, its potential impacts on existing water rights holders, water quality, wildlife (including aquatic wildlife), and cultural and tribal cultural resources could be equally or more significant than those of the Project. As noted above, there also are questions about the site suitability for hydroelectric use, since onsite streams would not have sufficient hydropower generation capacity to provide a reasonable alternative to the Project.

Cogeneration

Members of the public suggested during the scoping process that the County consider a cogeneration alternative to the Project. Following initial consideration, the County elected not to carry a cogeneration alternative forward for more detailed review.

Cogeneration produces electricity from waste heat. Multiple biomass generators in Shasta County use cogeneration technology, including three facilities in Anderson and two in Burney.[9] These facilities range in power output from Shasta Renewable Resources LLC's 6 MW wood-fired cogeneration plant to Wheelabrator's 55 MW wood-fired power plant. Although cogeneration capability "does not allow these firms to be energy self-sufficient, the systems can generate enough energy to supply a major portion of plant needs during peak demand periods" (Shasta County, 2004a). As explained in General Plan Section 6.4, Energy (Shasta County, 2004a), the County encourages the development of cogeneration sources. Recent efforts have been made to expand the amount of cogeneration capacity available in the region. The Sierra Institute for Community and Environment conducted a Biomass Cogeneration Facility Location Assessment for Fall River Resource Conservation District and The State Wood Energy Team in 2014 (Sierra Institute, 2014). Noting an overabundance of biomass in the Shasta-Trinity and Lassen National Forests and on private ownerships in the region, the Sierra Institute evaluated potential sites for a new combined heat and power facility of up to 3 MW in the Burney-Hat Creek area. Two sites were identified as promising: The Covanta combined heat and power facility in Burney and the Hat Creek Construction Company land located 4 miles north of the SR 299/89 junction.[10]

9 The Anderson facilities include Wheelabrator's 55 MW wood-fired power plant (Wheelabrator Technologies, 2019), Sierra Pacific Industries' 31 MW cogeneration power facility (County Use Permit 07-021), and Shasta Renewable Resources LLC's 6 MW wood-fired cogeneration plant (Central Valley RWQCB, 2016). The Burney facilities include Burney Forest Power's 31 MW biomass-fueled power plant (Bloomberg, 2019; Energy Justice Network, 2019) and a Sierra Pacific facility.

10 A facility on the Hat Creek Construction Company land has received permit approval, but as of June 2020 has not moved forward to construction.

A cogeneration alternative to the Project was not carried forward for more detailed consideration because it would not result in a commercial wind energy generation facility capable of generating up to 216 MW of wind energy and would not provide emissions-free energy for approximately 86,000 households, since there is no basis to assume that the energy it would generate would even offset the power required to operate the associated biomass facility much less contribute to other PG&E ratepayers.

Solar

Members of the public suggested during the scoping process that the County consider a solar power alternative to the Project. A potential solar energy alternative to the Project was not carried forward primarily because it would not meet most of the basic objectives of the Project. A solar project alternative would not result in the development, construction, and operation of a commercial wind energy generation facility capable of generating up to 216 MW of wind energy and, based on geographic considerations, would not reasonably be expected to offset approximately 128,000 metric tons of carbon dioxide emissions generated by fossil fuels or provide emissions-free energy for approximately 86,000 households.

A successful solar project would require an appropriate site. It does not appear that the Project Site would be appropriate for a utility scale solar project of a size that could functionally replace the Project based on a variety of factors, including low solar resource (NREL, 2017) further constrained by shading from trees and ridges, local climate, and topography. Research published by the World Bank Group's International Finance Corporation (IFC, 2015) describes the avoidance of shading for a solar project site as "critical" because even small areas of shade, e.g., from trees or overhead cabling, "may significantly impair the output of a module or string of modules." The Project Site is surrounded by timberlands, crossed by power lines, and shadowed by ridges. The Project Site climate also is not particularly conducive to a successful utility scale solar project. IFC (2015) identifies high wind speeds and snow as among the weather events that could adversely affect site suitability: "Locations with a high risk of damaging wind speeds should be avoided. Fixed systems do not shut down at high wind speeds, but tracking systems must shut down when high wind speeds are experienced." Further, "a site that that has regular coverings of snow for a long period of time may not be suitable for developing a solar PV power plant" (IFC, 2015). The Project Site is subject to high winds, and regular heavy snows. Project Site topography also is not conducive to solar development, which "[i]deally… should be flat or on a slight south-facing slope" (IFC, 2015). Elevations within the Project area range from about 3,000 to 6,600 feet, and the Project Site includes steep ridges rather than slight slopes. The County's initial assessment that a solar development would not be a reasonable or feasible alternative to the Project is underscored by the market: In 2018, of the 45 California counties where solar power plants had been installed, Shasta ranked 30th with a total of 8 MW (CEC, 2019d).

2.5.2.4 Alternative Approaches

Conservation and Demand-side Management

Members of the public suggested during the scoping process that the County consider conservation and demand-side management as an alternative to the Project. Conservation and demand side management consists of a variety of approaches to reduce electricity use and shift

electrical demand to times of the day when energy demand is lower. It includes increased energy efficiency and conservation, building and appliance standards, fuel substitution, and load management. Implementation of conservation and demand side management techniques could result in a reduction in demand, thus reducing the need for new generation, and thereby serve the region's growing demand for power. Conservation and demand-side management was not carried forward for more detailed consideration because it would not meet most of the basic objectives of the Project and would be speculative as well as infeasible from a technical perspective.

Increased energy efficiencies and reductions in energy demand would not meet Project objectives. They would not result in the development, construction, and operation of a commercially financeable wind energy generation facility capable of generating up to 216 MW of wind energy for interconnection to the Northern California electrical grid, would not directly assist California in meeting the renewable energy generation targets set in SB 100, would neither create temporary and permanent jobs in the County nor contribute to the County's tax base, and would not support landowners through diversification of revenue streams.

This potential alternative also was not carried forward because reliance on conservation and demand side management alone would be speculative and a technically infeasible alternative to the Project. The State's long-term Energy Efficiency Strategic Plan, as adopted by the California Public Utilities Commission (CPUC), provides an integrated framework of goals and strategies for saving energy through 2020 (CPUC, 2008; CPUC, 2011). The plan champions specific programmatic initiatives for key market sectors (i.e., commercial, residential, industrial, and agricultural) and a series of "big bold energy efficiency strategies" including all new residential construction being zero net energy by 2020 and all new commercial construction being zero net energy by 2030. Given the aggressiveness of these goals, it would be speculative to assume that incremental savings beyond them could be achieved. While energy efficiency efforts have been effective and will continue to be part of California's overall energy future, conservation and demand-side management alone will not be sufficient to address California's rising energy demand.

Other Distributed Energy Resources

In addition to energy efficiency and demand response, the range of distributed energy resources includes energy storage and "behind the meter" options such as customer generation (e.g., rooftop solar) and alternative fuel vehicles (e.g., electric vehicles). There is some indication that distributed energy use is on the rise. According to the 2019 California Green Innovation Index (Next10, 2019), the number of rebates rose dramatically from 2017 to 2018 for both plug-in hybrid electric vehicles (up 39 percent) and battery electric vehicles (up 67 percent). Behind-the-meter energy storage also has been on the rise; however, the CPUC reported in 2018 that this type of storage has not had the intended benefits in achieving greenhouse gas (GHG) emissions reductions (and in fact actually has increased GHG emissions) because charging has not occurred at times when there is excess renewable energy on the grid (CPUC, 2018b). The fact that distributed energy resources may have a growing role in California's energy future does not mean that it is a viable alternative to the Project.

Other Distributed Energy Resources was not carried forward for more detailed consideration because it would not meet most of the basic objectives of the Project. It would not result in the development, construction, and operation of a commercially financeable wind energy generation

facility capable of generating up to 216 MW of wind energy for interconnection to the Northern California electrical grid, and would not support landowners through diversification of revenue streams.

Improving the Efficiency of Existing Energy Infrastructure

Members of the public suggested during the scoping process that the County consider improving the efficiency of existing energy infrastructure for the delivery and storage of excess power already generated in California as an alternative to the Project. Separate from and independent of this applicant's proposed development of this Project, the California Independent System Operator (CAISO) has identified 12 transmission projects in PG&E's service territory that are needed to maintain transmission system reliability, including a dynamic voltage support project at Round Mountain (Rivera-Linares, 2019). The Round Mountain 500 kV Dynamic Voltage Support project is expected to be in service in 2024. These efficiency and reliability projects would be considered with or without the Project, and are not a viable alternative to it.

Existing Infrastructure Efficiency Improvements was not carried forward for more detailed consideration because this potential alternative would not meet most of the basic objectives of the Project. It would not result in the development, construction, and operation of a commercially financeable wind energy generation facility capable of generating up to 216 MW of wind energy for interconnection to the Northern California electrical grid, would not assist California in meeting the renewable energy generation targets, and would not support landowners through diversification of revenue streams. The approval of such improvements also is likely to be subject to the CPUC's authority, and not the County's.

2.5.3 Alternatives Evaluated in Detail in this EIR

2.5.3.1 No Project Alternative

CEQA Guidelines Section 15126.6(e) requires consideration of a No Project Alternative. Under the No Project Alternative, Use Permit No. UP 16-007 would not be issued and the Project would not be built. None of the proposed wind turbines and associated transformers, associated infrastructure, or ancillary facilities would be constructed, operated and maintained, or decommissioned on the Project Site. FAA-required safety lighting would not be installed. The proposed overhead and underground electrical collector system and communications lines would not be developed; and the onsite collector substation, switching station, and operation and maintenance (O&M) facility would not be constructed. Foundations would not be excavated, laydown areas would not be cleared, no new access roads would be constructed, and no existing roads would be improved. No groundwater well, water storage tank, or septic system would be installed onsite, and no construction-related or other refuse would be removed from the site. No electric power would be needed at the Project Site, or delivered to the regional grid from the Project Site. Existing stormwater drainage patterns on the site would not be affected. No materials delivery-related or other construction trucks, equipment, or additional vehicle trips would be made to, from, or within the site relative to baseline conditions. None of the proposed construction workers and none of the full-time employees would travel to or be employed on the Project Site; decommissioning and site restoration phase workers similarly would not be present.

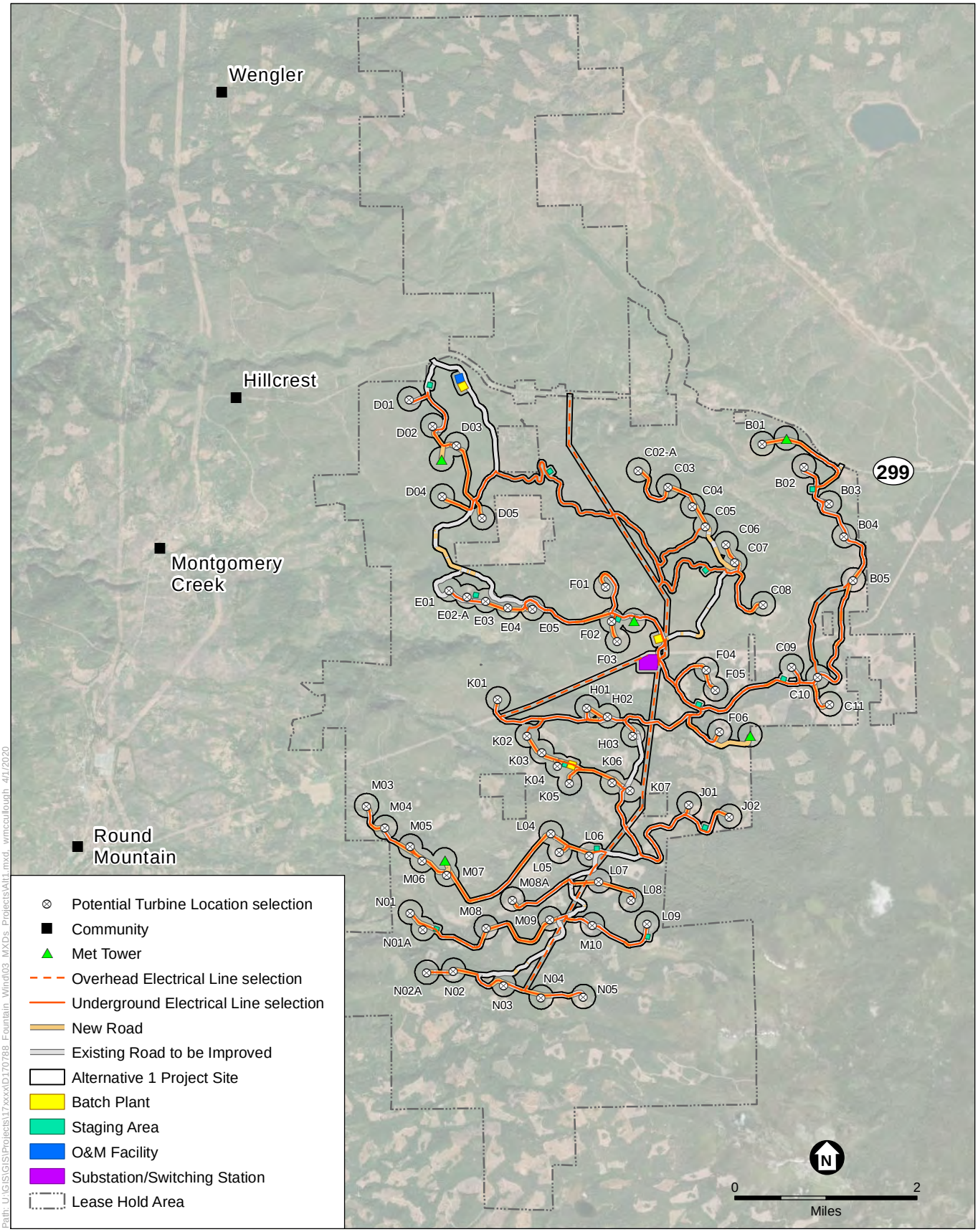
Instead, it is assumed that the land within the Project boundary would continue to be managed for timber production. The analysis of the No Project Alternative projects the environmental consequences of what reasonably would be expected to occur in the foreseeable future if the Project were not approved, based on the site's current General Plan designation as Timber (T), and its zoning designations of Timber Production (TP) (approximately 4,457 acres) and Unclassified (U) (approximately 6 acres). The same environmental benefits and impacts currently occurring would continue to occur. On the potential benefits side, for example, Section 6.2 of the Shasta County General Plan explains that "land dedicated to commercial forest management provides not only building materials, energy for industrial processes, firewood, County revenue for roads and schools, and employment opportunities, but also wildlife habitat, recreational opportunities, aesthetic enjoyment, and watershed." By contrast, the General Plan discussion continues, "Negative impacts from forest practices may affect surrounding land uses and resources and create special management problems for timberland operations. Harvesting practices and the associated noise, dust, and traffic can be potentially damaging to air and water resources, wildlife habitats, aesthetic enjoyment, and the health and safety of nearby residences, although state-required timber harvest plans are intended to mitigate timber harvesting impacts to acceptable levels. These problems can be magnified if incompatible land uses locate too close to one another." (Shasta County, 2004b).

In sum, the No Project Alternative would avoid all Project-related impacts but would cause impacts on the physical environment resulting from continued timber operations. No legal, regulatory, or technical feasibility issues were identified that would eliminate the No Project Alternative from consideration. However, the No Project Alternative would not meet any of the Project objectives.

2.5.3.2 Alternative 1: South of SR 299

Under Alternative 1, the South of SR 299 Alternative, the Project would be constructed, operated and maintained, and ultimately decommissioned as proposed south of SR 299, and none of the up to seven turbines proposed to the north of SR 299 (turbine numbers A01 through A07) or related infrastructure would be developed. The Alternative 1 Site would consist of the approximately 4,086 acres located south of SR 299, while the approximately 378 acres of the Project Site located north of SR 299 would continue to be managed for timber production. See **Figure 2-6**, *Alternative 1*. Each of Alternative 1's up to 65 turbines could be up to 679 feet tall, as measured from ground level to vertical blade tip (total tip height) (the same as the Project) and would have a generating capacity of 3 to 5.7 MW (also the same as the Project). Overall, Alternative 1 would have a total nameplate generating capacity of up to 195 MW and could provide emissions-free energy for approximately 9,880 fewer households relative to the Project (i.e., 91,746 households for Alternative 1 relative to the Project's 101,627 households).

The components and disturbance areas for Alternative 1 are summarized in **Table 2-6**, *Alternative 1 Components and Disturbance Areas*. For purposes of analysis, it is assumed that water, wastewater, and hazardous materials-related requirements would be substantially the same as for the Project; and that the number of workers and durations of construction, operation and maintenance, and decommissioning and site restoration also would be substantially the same as for the Project.



Fountain Wind Project

Figure 2-6
Alternative 1

TABLE 2-6
ALTERNATIVE 1 COMPONENTS AND DISTURBANCE AREAS

Project Component	Quantity	Area of Temporary Disturbance	Area of Permanent Disturbance
Turbines and pads (including temporary turbine construction areas)	Up to 65	5 acres per turbine (up to 325 total acres)	2.5 acres per turbine (up to 162.5 total acres)[a]
Underground electrical collector system[b]	Up to 48.9 miles	50-foot-wide corridor, up to a total of 297 acres	30-foot-wide corridor cleared of large vegetation, up to a total of 178 acres
Overhead electrical collector line and associated roads, work footprint, and permanent 2-track access road[c]	Up to 9.8 miles	100-foot-wide corridor, up to a total of 119 acres	80-foot-wide right of way cleared of large vegetation, up to a total of 95 acres
Onsite collector substation	1	8 acres	5 acres
Onsite switching station (including interconnection equipment)	1	11 acres	8 acres
Access roads (including crane roads)	Up to 22.2 miles of new roads	80-foot-wide disturbance area, up to a total of 215 acres. Nominally up to 200 foot-wide construction clear area in some locations to accommodate grading, slope stabilization, and blade delivery.	20-foot-wide drivable surface with a 1-foot shoulder on both sides and up to an additional 10 feet on either side where required for storm water drainage design, up to a total of 113 acres. Permanent disturbance width nominally up to 200 feet.
Widen existing access roads	Up to 28.9 miles of existing roads may be widened	80-foot-wide disturbance area, up to 224 acres of new disturbance. Nominally up to 200-foot-wide construction clear area in some locations to accommodate grading, slope stabilization, and blade delivery.	Permanently widen to 20 feet with up to 10 feet on either side where required for storm water drainage design, up to 84 acres. Permanent disturbance width nominally up to 200 feet in some locations.
O&M facility	1	5 acres	5 acres (including a 5,460-square foot O&M building and two 0.5-acre Operations storage sheds)
Temporary construction and equipment area, construction trailer area, and associated parking area	1	10 acres	0 acres
Temporary laydown areas	13	2 acres per laydown area (26 acres total)	0 acres
Temporary batch plant, if necessary	3	3 to 5 acres per batch plant (up to 15 acres total)	0 acres
MET Towers	4	1 acre per structure (4 acres total)	0.5 acre per structure (2 acres total)
Anticipated Total Temporary Construction Disturbance[d]: 1,259 acres (a reduction of 125 acres relative to the Project)			
Anticipated Total Permanent Disturbance: 652.5 acres (a reduction of 60.5 acres relative to the Project)			

NOTES:

[a] Includes defensible fire space around each turbine

[b] Portions of the underground collector system would be located within the access road construction buffer in order to minimize impacts. No additional permanent impacts would occur in these areas. This acreage includes the co-located overhead communications system.

[c] Acreage includes co-located underground communications system. An 80-foot-wide corridor centered on the transmission line is assumed for disturbance calculations.

[d] Timber harvested and timberland to be coverted is included within the anticipated disturbance areas.

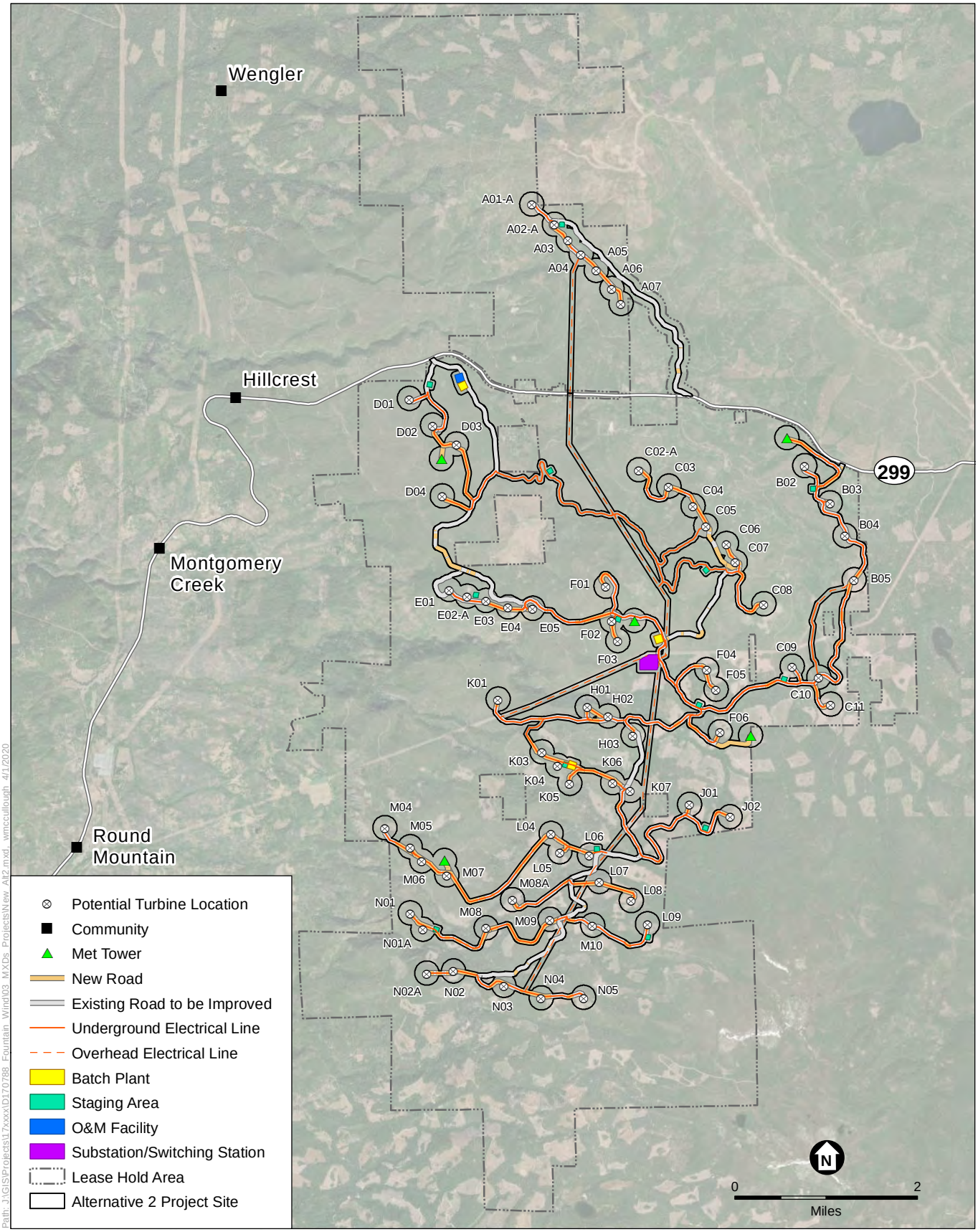
SOURCES: Table 2-1, as modified in accordance with assumptions described for Alternative 1.

Scoping comments suggested that the County consider a reduced-project alternative (i.e., one with fewer turbines and/or a more concentrated placement of turbines) and a modified project alternative that would relocate the proposed turbines to the south relative to the existing proposal. Alternative 1 responds to these suggestions. Relative to the screening criteria outlined in Section 2.5.1, the County preliminarily has determined that Alternative 1 may be feasible even if it would impede to some degree the attainment of the Project objectives relating to generating capacity, carbon dioxide emissions offset, and the number of households that could be served with clean energy if the Project were approved. Alternative 1 has been designed to avoid all Project impacts north of SR 299 and to lessen any significant effects of the Project to aesthetics, avian and other wildlife species and to Tribal Cultural Resources, including to birds traditionally important to the Pit River culture (e.g., eagles, eagle nests, and osprey) and audible and physical disruption of an area identified by Native Americans as culturally significant.

2.5.3.3 Alternative 2: Increased Setbacks

Under Alternative 2, the locations of four individual turbines would not be constructed due to their proximity to residential property and public roadways. The proposed setbacks would be increased relative to the Project to preclude turbine construction within three times the height of the turbine (i.e., within 2,037 feet) of a residential property line and within 1.5 times the height of the turbine (i.e., within 1,018.5 feet) of State Route 299, Supan Road, Terry Mill Road, or any other publicly maintained public highway or street. These setback distances would be among the largest in the State based on a comparison of setback requirements included in county ordinances in California for large wind projects as compiled by WINDExchange, a resource of the Wind Energy Technologies Office of the U.S. Department of Energy (DOE, 2020). Implementation of these setbacks would remove proposed turbines M03, D05, and B01 based on the residential property line setback, and would remove turbine K02 based on the roadway setback. Related infrastructure and work areas for these turbines (including temporary turbine construction areas, access roads and crane roads) would not be needed. The remaining turbines, infrastructure and other improvements would be the same as proposed for the Project. **Figure 2-7**, *Alternative 2*. The components and disturbance areas for Alternative 2 are summarized in **Table 2-7**, *Alternative 2 Components and Disturbance Areas*. Each of Alternative 2's up to 68 turbines could be up to 679 feet tall, as measured from ground level to vertical blade tip (total tip height) (the same as the Project) and would have a generating capacity of 3 to 5.7 MW (also the same as the Project). Overall, Alternative 2 would have a total nameplate generating capacity of up to 204 MW and could provide emissions-free energy for approximately 5,646 fewer households relative to the Project (i.e., 95,981 households for Alternative 2 relative to the Project's 101,627 households).

Scoping comments suggested that the County consider a project alternative that would move turbines further away from Moose Camp, and expressed concerns about noise, vibration, and safety. Alternative 2 has been designed to respond to these suggestions. Relative to the screening criteria outlined in Section 2.5.1, the County preliminarily has determined that Alternative 2 may be feasible even if it would impede to some degree the attainment of the Project objectives relating to generating capacity, carbon dioxide emissions offset, and the number of households that could be served with clean energy if the Project were approved.



Fountain Wind Project

Figure 2-7
Alternative 2

TABLE 2-7
ALTERNATIVE 2 COMPONENTS AND DISTURBANCE AREAS

Project Component	Quantity	Area of Temporary Disturbance	Area of Permanent Disturbance
Turbines and pads (including temporary turbine construction areas)	Up to 68	5 acres per turbine (up to 340 total acres)	2.5 acres per turbine (up to 170 total acres)[a]
Underground electrical collector system[b]	Up to 48.9 miles	50-foot-wide corridor, up to a total of 297 acres	30-foot-wide corridor cleared of large vegetation, up to a total of 178 acres
Overhead electrical collector line and associated roads, work footprint, and permanent 2-track access road[c]	Up to 9.8 miles	100-foot-wide corridor, up to a total of 119 acres	80-foot-wide right of way cleared of large vegetation, up to a total of 95 acres
Onsite collector substation	1	8 acres	5 acres
Onsite switching station (including interconnection equipment)	1	11 acres	8 acres
Access roads (including crane roads)	Up to 23 miles of new roads	80-foot-wide disturbance area, up to a total of 223 acres. Nominally up to 200 foot-wide construction clear area in some locations to accommodate grading, slope stabilization, and blade delivery.	20-foot-wide drivable surface with a 1-foot shoulder on both sides and up to an additional 10 feet on either side where required for storm water drainage design, up to a total of 117 acres. Permanent disturbance width nominally up to 200 feet.
Widen existing access roads	Up to 28.9 miles of existing roads may be widened	80-foot-wide disturbance area, up to 224 acres of new disturbance. Nominally up to 200-foot-wide construction clear area in some locations to accommodate grading, slope stabilization, and blade delivery.	Permanently widen to 20 feet with up to 10 feet on either side where required for storm water drainage design, up to 84 acres. Permanent disturbance width nominally up to 200 feet in some locations.
O&M facility	1	5 acres	5 acres (including a 5,460-square foot O&M building and two 0.5-acre Operations storage sheds)
Temporary construction and equipment area, construction trailer area, and associated parking area	1	10 acres	0 acres
Temporary laydown areas	13	2 acres per laydown area (26 acres total)	0 acres
Temporary batch plant, if necessary	3	3 to 5 acres per batch plant (up to 15 acres total)	0 acres
MET Towers	4	1 acre per structure (4 acres total)	0.5 acre per structure (2 acres total)
Anticipated Total Temporary Construction Disturbance[d] 1,282 acres: (a reduction of 102 acres relative to the Project)			
Anticipated Total Permanent Disturbance 664 acres: (a reduction of 49 acres relative to the Project)			

NOTES:

[a] Includes defensible fire space around each turbine

[b] Portions of the underground collector system would be located within the access road construction buffer in order to minimize impacts. No additional permanent impacts would occur in these areas. This acreage includes the co-located overhead communications system.

[c] Acreage includes co-located underground communications system. An 80-foot-wide corridor centered on the transmission line is assumed for disturbance calculations.

[d] Timber harvested and timberland to be coverted is included within the anticipated disturbance areas.

SOURCES: Table 2-1, as modified in accordance with assumptions described for Alternative 1.

2.6 Permits and Approvals

Permits and approvals that could be required for site preparation, construction, operation, maintenance, and decommissioning of the Project are summarized in **Table 2-8**, *Summary of Permits and Approvals*.

TABLE 2-8
SUMMARY OF PERMITS AND APPROVALS

Agency	Permit/Approval
Federal	
Federal Aviation Administration (FAA)	Notice of Proposed Construction or Alteration; Determination of No Hazard.*
U.S. Army Corps of Engineers (USACE)	Clean Water Act, Section 404 Nationwide Permit if jurisdictional waters of the U.S. could be affected by construction or operation of the Project.
U.S. Fish and Wildlife Service (USFWS)	Section 7 or Section 10 permits may be required if project results in take of a species listed under the federal Endangered Species Act (FESA).
State	
California Department of Forestry & Fire Protection (CAL FIRE)	Application for timberland conversion (Pub. Res. Code §4621 et seq.); approval of a timber harvesting plan (Pub. Res. Code §4582).
State Water Resources Control Board and/or Regional Water Quality Control Board (SWRCB and/or RWQCB)	Construction Stormwater General Permit; Notice of Intent to Comply with Section 402 of the Clean Water Act, SWPPP and SPCC Plan; Industrial Stormwater General Permit; Approval of O&M SWPPP and SPCC Plan. Section 401 certification if USACE determines jurisdictional waters of the U.S. would require a Clean Water Act Section 404 permit.
California Department of Fish and Wildlife (CDFW)	Streambed Alteration Agreement (Fish & Game Code §1600 et seq.); permit authorization if "take" of endangered, threatened, or candidate species could result incidental to an otherwise lawful activity (Fish & Game Code §2081).
California Department of Transportation	Oversize load permit(s) and variances for loads with a width over 15 feet and/or length over 135 feet. Encroachment Permit for utility line crossing state right-of-way.*
California Highway Patrol	Notification of Transportation of Oversize/Overweight Loads.*
California Public Utilities Commission	Approval of construction of switching station for transfer to PG&E (i.e., General Order 131-D).
Local	
Shasta County Air Quality Management District	Authority to Construct and/or Permit to Operate as needed.
Shasta County	Use Permit.
Shasta County Department of Resource Management, Environmental Health Division	Hazardous Materials Business Plan, septic system permit, well permit.*
Shasta County Building Division	Building and grading permits.*
Shasta County Hazardous Materials Program, CUPA	Hazardous Materials Business Plan and Permit for handling hazardous materials above threshold quantities (includes hazardous waste management).*
Shasta County, Public Works Department	Encroachment Permit.*

NOTE: * Typically processed as ministerial permits

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CHAPTER 3
Environmental Analysis

3.1 Introduction to Environmental Analysis

3.1.1 Overview

This chapter describes and analyzes the direct, indirect, and cumulative environmental impacts of the Project and alternatives, including the No Project Alternative, as they relate to the following areas of environmental consideration: Aesthetics, Agriculture and Forestry Resources, Air Quality, Biological Resources, Communications Interference, Cultural and Tribal Cultural Resources, Energy, Geology and Soils, Greenhouse Gas Emissions, Hazards and Hazardous Materials, Hydrology and Water Quality, Land Use and Planning, Mineral Resources, Noise, Population and Housing, Public Services, Recreation, Transportation, Utilities and Service Systems, and Wildfire.

3.1.2 Environmental Assessment Methodology

3.1.2.1 Environmental Baseline

The analysis of each issue area begins with a description of the actual physical environmental conditions in the area where a project and its alternatives would be implemented. These conditions also are referred to as the "baseline" relative to which Project-caused changes are analyzed to determine whether the change is significant for purposes of CEQA (CEQA Guidelines §§15125, 15126.2). For this Project, baseline conditions are those as they existed in January 2019 when the Notice of Preparation (NOP) was published unless as otherwise noted. The effects of the Project and alternatives are defined as changes to the environmental setting that are attributable to Project components or activities. Consistent with CEQA, an EIR need not analyze the effects of the existing environment on a project (including its users or occupants) unless the project exacerbates those conditions.

3.1.2.2 Impact Significance Criteria

CEQA lead agencies rely on impact significance criteria as benchmarks to determine whether changes to the existing environment caused by a project or an alternative would cause a significant adverse effect. A significant effect on the environment is "a substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project" (CEQA Guidelines §15382).

To guide the Lead Agency in determining whether the Project or an alternative may cause a significant impact on the environment, the preparers of this EIR (identified in Chapter 5, *Report Preparation*) have considered the series of questions provided in CEQA Guidelines Appendix G, as supplemented to consider whether the Project or an alternative could interfere with communications, including emergency communications.[1]

3.1.2.3 Impact Significance Conclusions

This EIR evaluates whether the Project and alternatives would cause a change in the environment. Conclusions reached are based on information in the record, including scientific and factual data as well as professional knowledge and judgment. Consistent with CEQA and the CEQA Guidelines, significance conclusions are characterized as one of the following:

1. **No Impact:** This signifies that a project or an alternative would not cause any change in the environment relative to the applicable significance criterion; under these circumstances, no mitigation measures would be required or may be imposed and the project or alternative could not cause or contribute to any cumulative effect.

2. **Less-than-Significant Impact:** This signifies that a project or an alternative could cause an adverse change in the environment, but not one that would be substantial, relative to the applicable significance criterion. Under these circumstances, no mitigation measures would be required or may be imposed. The analysis considers whether the project or alternative could cause or contribute to a potential cumulative effect.

3. **Less than Significant with Mitigation Incorporated:** This signifies that a project or an alternative could cause an adverse change in the environment that would be substantial relative to the applicable significance criterion, but that the implementation of one or more feasible mitigation measures would reduce the significance of the impact below the established threshold. The analysis considers whether the project or alternative could cause or contribute to a potential cumulative effect.

4. **Significant and Unavoidable:** This signifies that a project or an alternative could cause a substantial adverse change in the environment relative to the applicable significance criterion; however, either no feasible mitigation measures are available, or, even with implementation of feasible mitigation measures, the significance of the impact would remain above the established threshold. The analysis considers whether the project or alternative could cause or contribute to a potential cumulative effect.

5. **Cumulatively Considerable:** This signifies that a project-specific or alternative-specific contribution to a significant cumulative effect would be considerable when viewed in connection with the incremental impacts of past projects, the impacts of other current projects, and the impacts of reasonably foreseeable probable future projects (as defined in CEQA Guidelines §15130).

To avoid or reduce potential significant impacts where feasible, alternatives have been considered or mitigation measures have been recommended to address them. The effectiveness of recommended mitigation measures has been evaluated by analyzing the impact remaining after the implementation of the measure. In some cases, the implementation of more than one

[1] Case law interpreting CEQA has recognized that lead agencies generally have broad discretion to formulate significance thresholds, including the discretion to depart from the precise language of Appendix G questions.

mitigation measure may be needed to reduce the significance of an impact below an established threshold. The mitigation measures recommended in this document are identified on a resource-by-resource basis in this Chapter 3, *Environmental Analysis*. Potential significant impacts of the Project and associated mitigation measures are summarized in Table ES-2, *Summary of Project Impacts and Mitigation Measures*.

3.1.2.4 PG&E Interconnection Infrastructure

In each resource section included in this chapter, a subsection called "PG&E Interconnection Infrastructure" follows the analysis of the direct and indirect effects of the Project and precedes the analysis of the direct and indirect effects of the Alternatives. The purpose of this subsection is to call out the direct and indirect impacts of the Project as a whole, the mitigation of which would be within the jurisdiction of the California Public Utilities Commission (CPUC), which has permitting authority over a portion of the Project and which therefore is a Responsible Agency for purposes of CEQA. The CPUC regulates private investor-owned utilities in the state of California, including electric power companies like PG&E as well as natural gas, telecommunications, and water companies. PG&E's construction of the electrical connections to its infrastructure (as described in Section 2.4.3, *Project Substation, Switching Station and Interconnection Facilities*) would be subject to the CPUC's authority and oversight. Aspects of the Project to be constructed by the Applicant (such as the switching station and collector lines) would not be subject to the CPUC's authority and oversight. The impacts identified in the PG&E Interconnection Infrastructure subsections of this Chapter 3 are a subset of, not in addition to, the direct and indirect impacts of the Project as a whole.

3.1.3 Cumulative Effects Approach

As defined in CEQA Guidelines Section 15355, the term "cumulative impacts" refers to two or more individual effects, which, when considered together, are considerable or that compound or increase other environmental impacts. The cumulative impact from multiple projects is the change in the physical environment that results from the incremental impact of the proposed project when added to other closely related past, present, and reasonably foreseeable probable future projects. Cumulative impacts can result from individually minor but collectively significant projects taking place over a period of time (CEQA Guidelines §§15355[b], 15130[a][1]).

The analysis in this chapter evaluates potential cumulative impacts on a resource-by-resource basis by considering the incremental impacts of the Project together with the ongoing effects of past, present, and reasonably foreseeable probable future projects that could cause environmental impacts that are closely related to those caused by the Applicant's proposal. Factors considered in determining whether a project is included in the cumulative scenario include whether it would cause impacts of the same nature as the Project in the same area at the same time.

3.1.3.1 Cumulative Scenario

The cumulative scenario consists of trends; projections contained in one or more local, regional, or statewide planning documents; and the incremental effects of past, present, and reasonably foreseeable probable future projects summarized below by activity type.

Timber Management and Harvesting

Private ownership accounts for 39 percent of California's forestlands and has provided most of the State's timber since the 1940s (Taylor, 2018). While subject to annual variation, total timber harvesting statewide has declined by more than two-thirds since the late 1950s, and harvest rates have dropped from over 4.8 billion board feet in 1988—its recent peak—to approximately 900 million in 2009, when the harvest rate was at its lowest in recent history (Taylor, 2018). The Legislative Analyst's Office reports that "timber harvesting rates have picked up somewhat [since 2009], but have not returned to earlier levels" (Taylor, 2018).

The County General Plan designates the Project Site as "Timberlands." As of June 2020, approximately 58 percent of Shasta County were zoned for private timber production (1,454,680 acres of a total of 2,492,822 acres). Past, present, and reasonably foreseeable future timber harvesting plans (THPs) associated with the Project Site have been identified by the landowner. They are listed in **Table 3.1-1**, *Timber Harvest Plans in the Immediate Vicinity of the Project*. As explained in General Plan Section 6.2.2, "Negative impacts from forest practices may affect surrounding land uses and resources and create special management problems for timberland operations. Harvesting practices and the associated noise, dust, and traffic can be potentially damaging to air and water resources, wildlife habitats, aesthetic enjoyment, and the health and safety of nearby residences, although state-required timber harvest plans are intended to mitigate timber harvesting impacts to acceptable levels" (Shasta County, 2004). Ongoing impacts of past and current forest management activities within and near the Project Site are reflected in the baseline conditions described in the environmental setting on a resource-by-resource basis throughout this Chapter 3, *Environmental Analysis*.

TABLE 3.1-1
TIMBER HARVEST PLANS IN THE IMMEDIATE VICINITY OF THE PROJECT

THP Name	Acres	THP Number	THP Status	Year Submitted
Cedar Boots	378	2-16-077-SHA	Active	2016
South Ox	Unknown	2-16-075-SHA	Active	2016
Little Ox	431	2-17-077-SHA	Active	2017
Bunchgrass	439	n/a	In Preparation	n/a
East Lookout	Unknown	n/a	In Preparation	n/a
Forks	Unknown	n/a	In Preparation	n/a

SOURCE: ConnectGen, 2019.

National Forest System (NFS) lands account for approximately 38 percent of the commercial forest lands in Shasta County (Shasta County, 2004). The Project Site is within approximately 10 miles of three NFS forest management projects in the Shasta Trinity National Forest. First, the Project Site is approximately 7 miles from the southern boundary of the Chalk Mountain Plantation Thin and Underburn Project which includes thinning and underburning over approximately 2,834 acres to: (1) restore a more diverse and less dense forest stand structure and increase resilience to insect and disease infestations; (2) promote structural and species diversity;

(3) reduce overall fuel levels; and (4) restore eco-cultural systems upon which the tribal community depends (USFS, 2018a).

Second, the Project Site is approximately 7.5 miles from the northeastern boundary of the Green-Horse Restoration Project, which would entail prescribed burning and thinning on approximately 41,836 acres to reduce wildfire risk and protect, enhance, or maintain wildlife habitat quality (USFS, 2016).

Finally, while slightly outside the 10-mile boundary, the Project Site is approximately 10.4 miles from the southeastern boundary of the Bagley Hazard Tree Abatement Project which is intended to reduce risks to public safety along NFS roads affected by the Bagley Fire of 2012 by abating the hazards from dead and defective hazard trees (USFS, 2013).

Timber Land Conversion

Between 1969 and 1998, 112,866 acres of California's privately-owned timberland were converted to a variety of other uses, primarily grazing and subdivision development. Approximately 49 percent of these conversions occurred in the northern region, which includes Shasta County (Shih, 2019). Over the most recent decade of the 30-year period, the average conversion statewide was 2,256 acres per year; within the northern region, the average conversion 237 acres per year (Shih, 2019). Regarding this conversion trend, a technical working paper of CAL FIRE's Fire and Resource Assessment Program concluded, "The impact of conversions on timber supply is not significant, but in many local areas, conversions are a major land use issue" (Shih, 2019). Project-related timber conversion would be temporary rather than permanent, with the expectation that the Project Site would be returned to timberland use following the conclusion of the Use Permit term.

Fire History

Shasta County, which CAL FIRE has designated a "Very High Fire Hazard Severity Zone," experiences extreme fire weather conditions, particularly between May and September (Shasta County, 2016). Between 1992 and 2003, Shasta County experienced an average of 333 wildland fires per year (Shasta County, 2018). Other notable fires in Shasta County include, but are not limited to, the following (CAL FIRE, 2014, 2016, 2019a, 2019b; USFS, 2018b; Shulman, 2018):

1. Carr Fire, 2018 (229,651 acres burned, the seventh largest fire in California history)
2. Fountain Fire, 1992 (64,000 acres)
3. Delta Fire, 2018 (63,311 acres)
4. Hirz Fire, 2018 (46,150 acres)
5. Bald Fire, 2014 (39,736 acres)
6. Eiler Fire, 2014 (32,416 acres)
7. Bully Fire, 2014 (12,661 acres)
8. Hat Fire, 2018 (1,900 acres)
9. Fiddler Fire, 2016 (303 acres)
10. Montgomery Creek Fire, 2018 (51 acres)

Ongoing environmental impacts of wildfire may continue to be observable on the landscape, potentially including degraded air quality, wildlife habitat, and watersheds as well as increased GHG emissions and reduced carbon sequestration capacity (Shasta County, 2016). With the current urbanization in and around Round Mountain and Montgomery Creek, the area near the Project Site "can expect future fires to be more damaging" (CAL FIRE and Shasta County Fire, 2018). Ongoing impacts of past wildland fires within and near the Project Site are reflected in the baseline conditions described in the environmental setting on a resource-by-resource basis throughout this Chapter 3.

Weather Extremes

The 60-month period between January 2012 and December 2016 was the hottest on record in California, with an average temperature of approximately 60.2 degrees Fahrenheit (°F); it was also the 11th driest since 1895 (Pacific Institute, 2017a). Governor Brown lifted the drought emergency for most of the state, including Shasta County, on April 7, 2017, when he issued Executive Order B-40-17. However, environmental damage had already occurred. For example, the U.S. Department of Agriculture (USDA) reported a finding of the U.S. Forest Service that in "2016 alone, 62 million trees have died, representing more than a 100 percent increase in dead trees across the state from 2015. Millions of additional trees are weakened and expected to die in the coming months and years" (USDA, 2016). The prolonged drought also harmed fish, wildlife, and their habitats; threatened water supplies; and created environmental strains that increased the potential of high-intensity fires across the state (Executive Order B-40-17; Shasta County, 2016). Due to limited hydropower capacity during the drought, electric generation relied increasingly on natural gas – a more carbon-intensive option that led to a 10 percent increase in CO2 emissions from power plants (Pacific Institute, 2017b).

When it came, the end of the drought came quickly. The 2016/17 water year (which began on October 1, 2016) was the wettest on record (CDEC, 2019). Severe winter storms that year caused the water content in the state's mountain snowpack to achieve 164 percent of the season average, and flooding that nearly caused Oroville Dam, the nation's tallest, to fail (Executive Order B-40-17; Pacific Institute, 2017a). The impacts of these weather extremes are reflected in the environmental baseline and may have ongoing impacts that could combine with impacts of the Project to adversely affect existing conditions in the physical environment. These changes in weather patterns also may affect the State's wind resources. Based on 36 years of data that showed wind regime changes consistent with global warming and information from "several wind farm sites," research published by the California Energy Commission (CEC) projects that wind power generation capacity throughout California is expected to increase during the summer and decrease during fall and winter (CEC, 2018a).

Other Wind Projects

Considering in-state power plants with a nameplate capacity of 1 MW or greater, CEC data reports that wind energy generated 7.31 percent of the in-state total power generation in 2018, with wind energy power plants having a total capacity of 6,004 MW (CEC, 2019a). The wind energy generation contributions of Shasta County and other counties in the State are shown in **Table 3.1-2**, *California's Total Wind Production by County*.

TABLE 3.1-2
CALIFORNIA'S TOTAL WIND PRODUCTION BY COUNTY

County	Capacity (MW)
Kern	3,474.00
Solano	1,035.30
Riverside	643
Imperial	265.4
Alameda	228.1
San Diego	182.1
Shasta	101.2
Contra Costa	38
Merced	18.4
San Bernardino	7.2
Monterey	3.9
San Joaquin	3.5
Los Angeles	1.9
Tehama	1
Yolo	1
TOTAL	6,004.0

SOURCE: CEC, 2019a

The Hatchet Ridge Wind Project is Shasta County's only existing wind project. It began commercial operation in 2010, and its 44 wind turbines have the capacity to generate 101.2 MW of electricity within a permanent project footprint of approximately 75.6 acres. Consistent with FAA regulations, the project includes rapid-discharge flashing red safety lighting and can be seen from some vantages day and night. Following construction, avian and bat mortality monitoring occurred for three years and site reforestation efforts took place, including the planting of more than 62,000 pine trees, including commercial Christmas trees. Approximately 6 to 10 local people operate and maintain the facility. They normally work from 7 a.m. to 5 p.m. The project interconnects with a PG&E transmission line that crosses the site. PG&E purchases 100 percent of the electricity generated by the project (Pattern Energy, 2019; Shasta County, 2008). Ongoing impacts of this existing project may combine with the incremental impacts of the Project to cause or contribute to cumulative effects.

Power Lines and Electrical Infrastructure

The California Independent System Operator (CAISO) manages the operation of California's power grid, including the generation and transmission of electricity by PG&E. The CAISO divides the state into three regions: NP15, a key segment of California's north-south power transmission corridor, corresponds to PG&E's electric service territory (CAISO, 2008; PG&E, 2014).

Existing electrical infrastructure on and near the Project Site include two, 230 kV transmission lines that cross the Project Site south of SR 299 (CEC, 2014). The Project would interconnect to the grid along these lines. Other PG&E 230 kV infrastructure in the area includes the Carberry switching station, which is connected to the Hatchet Ridge Wind Project substation as well as the Burney Substation and points to the northeast, and the Round Mountain Substation (Dashiell

Corporation, 2019; CEC, 2014). Other area electrical infrastructure includes PG&E's Cedar Creek Substation (33 kV to 92 kV), Burney Forest Power's substation (220 kV to 287 kV), Sierra Pacific BFP (220 kV to 287 kV), and PG&E's Burney Substation (33 kV to 92 kV) (CEC, 2014; CEC, 2019b). A "bulk dynamic reactive voltage system" project has been proposed in connection with the Round Mountain Substation to address existing voltage issues on the 500 kV network in Northern California. This additional transmission reliability project is separate from and independent of the Project and would be considered by the CPUC regardless of the County's consideration of the Project. None of the current projects identified by the California Public Utilities Commission (CPUC) suggests that additional work is proposed along PG&E's transmission line in the vicinity of the Project Site (CPUC, 2019a).

Surface Mining and Reclamation Projects

Active mining projects, including extraction and reclamation, are considered because they could generate impacts similar to the impacts of the Project, e.g., traffic, ground disturbance, or lighting. Idle mines are not considered because the absence of activity on an idle site would not contribute incremental impacts to cumulative conditions. Additional details are provided in **Table 3.1-3**, *Active and Reclaimed Mines in Shasta County*.

TABLE 3.1-3
ACTIVE AND RECLAIMED MINES IN SHASTA COUNTY

Project ID	APN	CA Mine ID# 91-45-	Shasta County Reclamation Plan #	Use Permit	Mine Name	Status
1	307340004000	0001	2-88	85-73	SWA Mountain Gate Quarry	Active
2	23320036000	0006	6-88	37-89	Brush Mountain (Packway)	Active
3	307360003000	0012	00-03	63	Gray Rocks Quarry	Active
4	307010004000	0013	03-001	297-78	Falkenbury Quarry	Active
5	55240003000	0014	2-77	69-73A	Shea Sand and Gravel	Active
6	208230023000	0016	4-78	288-77	Shea Sand and Gravel Plan II (aka Hinds Pit)	Active
7	307350016000	0017	2-91	52-91B	Fawndale Quarry	Active
8	22200008000	0018	1-78A	185-78A	Dicalite	Active
9	30110006000	0020	4-94		Brush Mountain - BLM	Active
10	65250002000	0021	07-002	07-020	Crystal Creek Aggregate	Active
11	18350005000	0022	5-94		Blue Sand Cinder Pit	Active
12	23350001000	0024	4-92	64-92	Braden Sand Pit	Active
13	704150019000	0028	2-93		Black Butte Cinders	Active
14	97310032000	0029	4-93A		Oak Run Quarry	Active
15	704230003000	0036	3-94	39-94	Wildcat Pit	Active
16	30110005000	0045	2-95	22-95A	"Brush Mountain - Fruit Growers"	Active
17	23320024000	0049	97-1	97-28	Hidden Valley Quarry	Active
18	23250014000	0052	99-01	99-17	Eastside Aggregates	Active
19	22130025000	0053	01-001	01-016	Bales Mountain Quarry	Active
20	206350035000	0056	02-002	02-035	West Valley Sand & Gravel	Reclamation has begun
21	91050024000	0057	05-001	05-010	Shasta Ranch Pit	Active
22	50090027000	0058	06-001	06-038A	Wakeboard Park 3	Active

TABLE 3.1-3 (CONTINUED)
ACTIVE AND RECLAIMED MINES IN SHASTA COUNTY

Project ID	APN	CA Mine ID# 91-45-	Shasta County Reclamation Plan #	Use Permit	Mine Name	Status
23	60020044000	0059	05-004	05-039	Twin Mine	Active
24	30090020000	0005	1-85	105-85	Jack Rabbit Flat Lava Rock	Reclamation has begun
25	16250004000	0042	01-002		Ben Bridge Trust Cinder Pit	Reclamation has begun

NOTES:
[a] Table footnote text

SOURCE: Shasta County, 2019a.

Other Present and Reasonably Foreseeable Probable Future Projects

Projects within the Shasta County permit system as of the date of the NOP (January 15, 2019), were evaluated to identify projects that would cause environmental impacts that could combine with those of the Project (**Table 3.1-4**).

TABLE 3.1-4
POTENTIALLY CUMULATIVE COUNTY PROJECTS

Project ID	APN	Status	Date Applied	Project Name	Site Address
1	207170008000.00	Applied	4/23/2019	Amendment to UP10-001	18703 Cambridge Rd
2	76260002000.00	Approved	4/18/2019	TR1945 EOT #2 (11 Parcel Land Division)	
3	58300060000.00	Approved	4/16/2019	TR1992 EOT #2 (Eleven Lot Subdivision)	8589 Silver Bridge Rd
4	83240006000.00	Applied	4/8/2019	Small RV Park	
5	59110082000.00	Applied	12/6/2018	Parcel Map Commercial	
6	704280013000.00	Approved	12/5/2018	TR1989 EOT (38 Lot Subdivision with Remainder)	
7	31610010000.00	Approved	10/4/2018	Hat Creek Radio Observatory	
8	111290011000.00	Approved	9/24/2018	Resubmittal and Amendment to TR1977 – Unit 2 Phase 2	
9	30390042000.00	Approved	9/5/2018	UP13-001 E1	37750 Highway 299 E
10	74100007000.00	Approved	8/20/2018	UP47-88A	
11	57140019000.00	Approved	8/15/2018	PM07-035E2 (3 Parcel Split)	
12	306050005000.00	Approved	8/2/2018	TR1973EOT	Union School Rd
13	306050003000.00	Approved	8/2/2018	TR1985EOT (4 Lots Plus Remainder Parcel)	
14	28370024000.00	Approved	5/31/2018	20,000 sq. ft. Grocery Store/Parking/Loading Dock	State Highway 299 E
15	50100015000.00	Approved	10/10/2017	Reclamation Plan for UP17-005	
16	85270003000.00	Applied	6/19/2019	T-Mobile Wireless Mono Pole	17211 Chapman Ln

SOURCES: Shasta County, 2019; Environmental Science Associates, 2019

In addition to evaluating potential projects in the Shasta County permit system, CEQANet was consulted to identify other projects within Shasta County with lead agencies other than the County. Additionally, the City of Redding, CALFIRE, Caltrans, and the Shasta-Trinity National Forest, and Lassen National Forest were contacted to identify projects that could have environmental impacts that could overlap with impacts resulting from the Project. **Table 3.1-5**, *Other Potentially Cumulative Projects within Shasta County*, includes the projects that were identified as part of this process.

TABLE 3.1-5
OTHER POTENTIALLY CUMULATIVE PROJECTS WITHIN SHASTA COUNTY

Project ID	Project Name/ Applicant	Location/Approximate Distance from Project Site	Description	Status
1	Dignity Health North State Pavilion Project	At the intersection of Cypress/ Hartnell just west of I-5 in Redding. Approximately 33 miles southwest from the Project Site.	Hospital campus including three buildings with parking and landscaping on an approximately 10.55-acre site.	Construction is expected to begin Spring 2020 and be completed in 2022
2	River Crossing Marketplace Specific Plan	Northeast corner of South Bonnyview Road and Bechelli Lane just off of I-5 in Redding. Approximately 34 miles southwest of the Project Site.	222,000 square feet of retail use including a discount warehouse store with up to 15 fuel pumps and retail pads accommodating up to 70,000 square feet of retail, restaurants (some with drive through lanes), and service uses	Unknown
3	Redding Rancheria Fee-to-Trust and Casino Project	Strawberry Fields Site, just west of I-5. Approximately 34 miles southwest of the Project Site.	232-acre site to be developed with a casino, hotel, and conference and event center	Unknown
4	NCPA Solar Project 1 - Redding Airport Site	Redding Airport. Approximately 34 miles southwest of the Project Site.	Development of 11.4 MW of PV panels on approximately 54.7 acres	Unknown
5	Shasta College Facilities Master Plan Amendment One Initial Study & Mitigated Negative Declaration	Old Oregon Trail & SR 299. Approximately 29 miles southwest of the Project Site.	Demolition of some existing campus buildings, renovation of existing buildings, construction of new buildings and features.	Demolition (2019-2030), Construction and renovation (2019-2030)
6	Bethel Church of Reddinq Colyer Drive Campus Planned Development	2080 Collyer Drive, Redding, Shasta County, CA. Approximately 29 miles southwest of the Project Site.	Construction and operation of a new church campus on 39.3 acres	Unknown
7	Sun Oaks Subdivision	3600 Argyle Road. Approximately 32 miles southwest of the Project Site.	Divide 26.9 acres into 51 single family lots	NOD approved 3/15/2019
8	02-0J200 Hatchet Mountain AR Chip, PM 60-67.8	State Route (SR) 299 at post mile (PM) 60.0/67.8 in Shasta County	Caltrans will place an asphalt rubber (AR) chip seal over the existing asphalt from edge of travelled way (ETW) to ETW. All work will be done within the existing edge of pavement. No work will be performed on bridge decks. There will be no increase in disturbed soil area.	NOE filed 9/26/19. Construction period 2021
9	02-1H570 Burney CapM, PM 67.8-77.8	State Route (SR) 299 at post mile (PM) 67.8-77.8 in Shasta County	The Project will not result in new disturbed soil or new impervious surfaces.	Construction period 2022-2023
10	Landvest Helicopter Dip Tank Installation	Within and adjacent to the Project Site	Landvest (owner of the Project Site) has installed and will be installing helicopter dip tanks throughout its ownership to aid fire suppression, including within the Project Site.	Ongoing

SOURCES: CEQANet, 2019; Bonin, 2019, Caltrans, 2019.

3.1.3.2 Cumulative Impacts Analysis

Incremental impacts resulting from initial site preparation and construction, operation and maintenance, and decommissioning and site restoration could combine with the incremental impacts of other projects to cause or contribute to cumulative effects. Direct and indirect effects of the Project are analyzed on a resource-by-resource basis throughout this Chapter 3. Where the Project would cause no impact to a given resource, it could not cause or contribute to any cumulative impact related to such resources. See, e.g., Section 3.1.3, *Environmental Topics Removed from Consideration*.

For the remaining resource areas, this Draft EIR analyzes potential incremental impacts of the Project and alternatives combined with the incremental impacts of past, other present, and reasonably foreseeable future projects, and determines whether the incremental impacts of the Project would be significant and, if so, whether the incremental contribution of the Project would be cumulatively considerable. As noted above, the geographic scope of the cumulative effects analysis for each resource area is tailored to the natural boundaries of the affected resource. Unless otherwise noted in the analysis, potential cumulative effects could occur at any time during the conditional use permit period, from the moment on-site activities begin to the conclusion of post-Project site restoration activities. Existing conditions within the cumulative impacts area reflect a combination of the natural condition and the ongoing effects of past actions in the affected area.

3.1.4 Environmental Considerations Unaffected by the Project or Not Present in the Project Area

CEQA Guidelines Appendix G suggests that lead agencies consider potential impacts to 20 different aspects of the physical environment to guide thinking and disclosure about a wide range of potential environmental consequences. The 20 suggested resource areas include: Aesthetics, Agriculture and Forestry Resources, Air Quality, Biological Resources, Cultural Resources, Energy, Geology/Soils, Greenhouse Gas Emissions, Hazards & Hazardous Materials, Hydrology/Water Quality, Land Use/Planning, Mineral Resources, Noise, Population/Housing, Public Services, Recreation, Transportation, Tribal Cultural Resources, Utilities/Service Systems, and Wildfire. The County has analyzed potential impacts in each of these areas, as well as potential impacts to Communications Interference (see Section 3.5). However, there are some resources that are not present in the relevant area, or that would not be affected by implementation of the Project. This is true, for example, with respect to Agricultural Resources, Land Use and Planning, Mineral Resources, Population and Housing, Public Services, and Recreation. Analysis and explanation of why the project would result in no impact to each of these resource categories is provided below. The Project also would have no impact to some (but not all) of the considerations identified in CEQA Guidelines Appendix G checklist for other resources, such as Air Quality, Biological Resources, and others. Analysis and explanation of the individual "no impact" considerations within resource groups also are provided below to focus the sections that follow on areas where the Project could result in a potential significant impact. See, e.g., Section 3.3, *Air Quality*, and Section 3.4, *Biological Resources*.

3.1.4.1 Agriculture and Forestry Resources

Agriculture

According to CEQA Guidelines Appendix G Section II, a project would result in a significant impact to agriculture resources if it would: a) Convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland), as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use; b) Conflict with existing zoning for agricultural use, or a Williamson Act contract; or c) Involve other changes in the existing environment that, due to their location or nature, could result in conversion of Farmland to non-agricultural use. Neither the Project nor Alternative 1 or 2 would result in any impact relative to these considerations.

Maps produced by the California Resources Agency pursuant to the Farmland Mapping and Monitoring Program show that there is no Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) in the Project Site (California Department of Conservation, 2016), nor is any land in the Project Site zoned for agricultural use or subject to a Williamson Act contract. The nearest area designated as Prime Farmland is an approximately 110-acre site 0.25 mile southeast of the closest proposed turbine. Therefore, the Project and Alternatives 1 and 2 would have no impact on agricultural resources and could not cause or contribute to any cumulative impact to such resources.

Forestry

CEQA Guidelines Appendix G Section II also considers potential impacts to forestry resources. For example, according to CEQA Guidelines Appendix G Section II(c), a project would result in a significant impact to forest resources if it would: "Conflict with existing zoning for, or cause rezoning of, forest land…, timberland…, or timberland zoned Timberland Production." For purposes of this analysis, forest land is described in Public Resources Code Section 12220(g) as "land that can support 10-percent native tree cover of any species, including hardwoods, under natural conditions, and that allows for management of one or more forest resources, including timber, aesthetics, fish and wildlife, biodiversity, water quality, recreation, and other public benefits." Timberland is defined in Section 4526 of the Z'Berg-Nejedly Forest Practice Act (Pub. Res. Code §4526) as "land, other than land owned by the federal government and land designated by the board as experimental forest land, which is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products…." Timberland Production is defined by Government Code Section 51104(g) as "an area which has been zoned [timberland production] pursuant to Section 51112 or 51113 and is devoted to and used for growing and harvesting timber, or for growing and harvesting timber and compatible uses." In this context, "compatible uses" are expressly defined in Section 51104(h) to include the "erection, construction, alteration, or maintenance of gas, electric, water, or communication transmission facilities."

Neither the Project nor Alternatives 1 or 2 would result in any impact relative to consistency with existing zoning for Forest Resources. The Shasta County General Plan designates the Project Site as Timber (T); the zoning designations are Timber Production (TP) (approximately 4,457 acres) and Unclassified (U) (approximately 6 acres). Existing land uses within the Project Site consist

exclusively of managed forest lands. Unpaved logging roads and transmission lines cross the Project Site. Chapter 17.08, Timber Production District, in the Shasta County Zoning Ordinance identifies the uses allowed in the TP district if a use permit is issued, including "the erection, construction or alteration of a gas, electrical, water or communication facility, or other public improvements, in accordance with Government Code §51152." Neither the Project nor alternatives would cause an impact because the uses allowed on the Project Site by the County's General Plan and zoning designation are consistent with the state's definitions of forest land, timberland, and timberland zoned Timber Production.

See Section 3.8, *Forestry Resources*, for analysis of other forest resource-related considerations identified in CEQA Guidelines Appendix G Section II.

3.1.4.2 Air Quality

Scoping comments from the Shasta County Air Quality Management District (AQMD) suggested that onsite fuel dispensing and storage must meet California Phase 1 vapor recovery requirements. However, the Vapor Recovery Program controls vapor emissions from gasoline marketing operations (gasoline dispensing facilities or service stations, tanker trucks [cargo tanks], bulk plants, and terminals), where gasoline vapor is a precursor to the formation of ozone and contains benzene, a constituent of gasoline vapor that has been identified as a toxic air contaminant (TAC). As shown in Table 2-3, *Hazardous Materials*, gasoline would not be stored onsite during any phase of the Project. Therefore, the requirements of the Vapor Recovery Program do not apply to the Project or Alternatives 1 or 2.

Scoping comments from the Shasta County Air Quality Management District also recommended, in the event that proposed operations would be conducted in an area containing naturally occurring asbestos, that a plan be submitted that meets the requirements of the Asbestos Airborne Toxic Control Measure for Construction, Grading, Quarrying, and Surface Mining Operations. The Project Site is not located in such an area. Asbestos is a term used for several types of naturally occurring fibrous minerals that are a human health hazard when airborne. The most common type of asbestos is chrysotile, but other types such as tremolite and actinolite are also found in California. Asbestos is classified as a known human carcinogen by state, federal, and international agencies and was identified as a TAC by the California Air Resources Board (CARB) in 1986. All types of asbestos are hazardous and may cause lung disease and cancer. Serpentinite may contain chrysotile asbestos, especially near fault zones. Ultramafic rock, a rock closely related to serpentinite, may also contain asbestos minerals. According to the California Division of Mines and Geology, nearest units of ultramafic rocks are mapped approximately 60 miles to the west of the Project Site (DMG, 2000). Because Project operations would not occur in an area containing naturally occurring asbestos, the Project and Alternatives would have no impact relating to naturally-occurring asbestos, and the preparation of a plan like the one suggested by the Air District has not been recommended as part of this CEQA process.

See Section 3.3, *Air Quality*, for analysis of the air quality-related considerations identified in CEQA Guidelines Appendix G Section III.

3.1.4.3 Biological Resources

According to CEQA Guidelines Appendix G Section IV, a project would result in a significant impact to biological resources if it would: "(e) Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance" or "(f) Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan." The Project and alternatives would have no impact in either respect because Shasta County does not have a tree protection ordinance, nor any language regarding tree preservation or heritage trees in the General Plan (see Section 3.4.1.3, *Regulatory Setting*). Further, there is no adopted Habitat Conservation Plan, Natural Community Conservation Plan or other approved habitat conservation plan covering the Project Site. Thus, there would be no impact to either of these biological resources-related considerations.

See Section 3.4, *Biological Resources*, for analysis of the other considerations identified in CEQA Guidelines Appendix G Section IV.

3.1.4.4 Cultural Resources

According to CEQA Guidelines Appendix G Section V(a), a project would result in a significant impact to cultural resources if it would: "Cause a substantial adverse change in the significance of a historical resource pursuant to §15064.5." In this context, a significant impact would occur if the Project caused a substantial adverse change to a historical resource, herein referring to historic-era architectural resources or the built environment, including buildings, structures, and objects. Based on the results of the cultural resources analysis completed for the Project (Stantec, 2019), there are no historic-era architectural resources that qualify as historical resources within the Project Site. Thus, there would be no direct impact to historical resources relating to the built environment from any phase of the Project or Alternative 1 or 2, including site clearing and construction, as well as operation\maintenance, decommissioning or site reclamation.

See Section 3.6, *Cultural and Tribal Cultural Resources*, for analysis of the other considerations identified in CEQA Guidelines Appendix G Section V and Section XVIII.

3.1.4.5 Electric and Magnetic Fields

Scoping comments enquired about and suggested potential impacts of electromagnetic radiation (electric and magnetic fields [EMFs]) from high voltage power lines and turbines and their potential to cause neurological problems, cancer, Alzheimer's disease, dementia, Parkinson's disease, and depression (Appendix J). It does not appear that any of the studies identified in scoping comments have undergone peer review (i.e., none has been scrutinized with normal scientific rigor, met outside scientific review, been submitted to a scientific journal for review by independent scientists, or published in a scientific journal) and none of the studies identified in scoping comments rises to the level of substantial evidence.

EMFs consist of waves of electric and magnetic energy moving together. On the electromagnetic spectrum, power lines result in 50 to 60 cycles per second (or "hertz," Hz, which is an extremely

low-frequency (ELF) EMF exposure. By comparison, television and radio broadcasts, mobile phones, and wireless local area networks (wi-fi) all cause higher frequency exposures, and x-rays and therapeutic radiation each cause still-higher frequency exposures (National Cancer Institute, 2019). Electric charges produce electric fields; the flow of electrical current through wires or electrical devices produce magnetic fields. For this reason, EMF occurs close to power lines. Because the strength of the EMF is proportional to the amount of electrical current passing through the power line and decreases as you move farther away, potential exposure to an EMF field from a power line decreases with distance (USEPA, 2019; CPUC, 2019b).

Although no federal, state, or local standards regulate EMF from power lines or related facilities, such as substations, the CPUC regularly revisits the question of whether there is a sufficient scientifically verifiable relationship between EMF exposure and negative human health consequences to support regulation. On January 15, 1991, the CPUC initiated an investigation to consider its role in mitigating the health effects, if any, of electric and magnetic fields from utility facilities and power lines (CPUC, 1991). The California EMF Consensus Group was created to advise the CPUC on this issue. The Group consisted of 17 stakeholders representing citizen groups, consumer groups, environmental groups, state agencies, regulated utilities, and others (CPUC, 1993). Its fact-finding process was open to the public, and its report incorporated public concerns. Based on the work of the Group, written testimony, and evidentiary hearings, the CPUC issued a decision (D.93-11-013) on November 2, 1993, in which it found no scientific link between power frequency EMFs and adverse human health effects: “We do not find it appropriate to adopt any specific numerical standard in association with EMF until we have a firm scientific basis for adopting any particular value” (CPUC, 1993). The CPUC reaffirmed its conclusion in 2006: “[A]t this time, we are unable to determine whether there is a significant scientifically verifiable relationship between EMF exposure and negative health consequences” (CPUC, 2006). This continues to be the case. As reported in 2019, “The Commission is unable to determine whether there is a significant scientifically verifiable relationship between EMF exposure and negative health consequences” (CPUC, 2019c).

Others agree. The World Health Organization (WHO) explored the potential link between prolonged exposure to ELF EMF (0 Hz to 100 Hz) and neurodegenerative disorders (e.g., Alzheimer disease, Parkinson disease, and amyotrophic lateral sclerosis [ALS]) and with neurobehavioural effects (e.g., depression and suicide) (WHO, 2007). Regarding neurodegenerative disorders, the WHO report concluded, “No study has provided clear evidence of an association with above-average exposure to extremely low frequency EMFs and, in the absence of laboratory evidence to the contrary, it seems unlikely that such fields are involved in the disease” (WHO, 2007). Regarding neurobehavioural disorders, the WHO report concluded that the literature reflects findings that are not consistent and that cannot easily be resolved (WHO, 2007). The National Institute of Environmental Health Sciences (NIEHS), which is part of U.S. Department of Health and Human Services, cites “power lines” as an example of a source of EMF of the type that “is generally perceived as harmless due to its lack of potency” (NIEHS, 2018). Separately, the National Cancer Institute reviewed numerous epidemiologic studies and comprehensive reviews of the scientific literature evaluating possible associations between exposure to non-ionizing EMFs and risk of cancer in children before concluding, “No consistent evidence for an association between any source of non-ionizing EMF and cancer has been found”

(National Cancer Institute, 2019). Similarly, from the U.S. Environmental Protection Agency, "Scientific studies have not clearly shown whether exposure to EMF increases cancer risk. A few studies have connected EMF and health effects, but they have not been able to be repeated. This means that they are inconclusive. Scientists continue to conduct research on the issue" (USEPA, 2019).

This EIR does not consider potential impacts relating to EMF in further detail because: (a) there is no agreement among scientists that EMF creates a potential risk to human health, (b) there are no defined or adopted CEQA standards for defining health risk from EMF, and (c) the County has determined that the potential for health effects associated with EMF exposure is too speculative to allow for a meaningful evaluation of the potential impacts.

3.1.4.6 Energy Resources

According to CEQA Guidelines Appendix G Section VI(b), a project would result in a significant impact to energy if it would: "Conflict with or obstruct a state or local plan for renewable energy or energy efficiency." Neither the Project nor Alternatives 1 or 2 would have any impact in this respect.

Although the Project would provide a new source of renewable energy in the state, the specific existing sources of energy that could be replaced by this Project are unknown. The Project would supply wind energy to PG&E's northern California grid, and would be available to reduce the potential demand of nonrenewable generated power. According to CARB, for the most part, the power being displaced due to renewable energy generation would be comprised of incremental power provided by generators to address load changes (natural gas power plants typically serve as the incremental power source) (CARB, 2010). Therefore, the Project would directly support Senate Bill (SB) 100 and California's Renewables Portfolio Standard (RPS) goal of increasing the percentage of electricity procured from renewable sources to 100 percent by 2045.

The Project would require diesel and gasoline fuel, as well as minimal amounts of electricity through the life of the Project. (See Section 3.7, *Energy*, for related analysis.) However, these energy inputs would be offset by the anticipated Project generation of approximately 605,491,200 kilowatt-hours (kWh) per year.

In terms of mobile energy usage, as described above, the National Highway Traffic Safety Administration (NHTSA) required manufacturers of light duty vehicles to meet an estimated combined passenger car and light truck average fuel economy level of 34.1 miles per gallon (mpg) by model year 2016. In the course of more than 30 years, the National Energy Conservation Policy Act (NECPA) regulatory program has resulted in improved fuel economy throughout the United States' vehicle fleet, and has also protected against inefficient, wasteful, and unnecessary use of energy.[2] The projected fleet-wide mpg for light duty vehicles is expected to reach 41.7 mpg by 2020 (USEPA, 2012). Vehicles used for Project construction, maintenance,

[2] The NECPA (42 U.S.C. §8201 et seq.) serves as the underlying authority for federal energy management goals and requirements and is the foundation of most federal energy requirements. The NECPA establishes energy-efficiency standards for consumer projects and energy-efficiency standards for new construction.

and decommissioning workers to travel to and from the Project Site would already incorporate these standards; therefore, the Project would not impede the efficient use of mobile fuel.

The O&M building on the Project Site would be subject to the Building Energy Efficiency Standards required by regulations (24 Cal. Code Regs. Part 6) implementing the California Energy Code. These standards are intended to save energy, increase electricity supply reliability, and avoid the need to construct new fossil-fueled power plants (CEC, 2018b). Pursuant to the California Building Standards Code and the Energy Efficiency Standards, the County would review the design components of the Project's energy conservation measures when the Project's building plans are submitted. These measures could include: insulation, use of energy-efficient heating, solar-reflective roofing materials, energy-efficient indoor and outdoor lighting systems, and other measures. The Project also would be subject to CALGreen during construction and decommissioning activities, which requires 65 percent construction and demolition waste diversion.[3]

Since the Project would provide a new source of renewable energy supporting SB 100 and the State's energy goals, offset its fuel usage, and comply with fuel and energy efficiency regulations, the Project would not conflict with or obstruct a State or local plan for renewable energy or energy efficiency, and no impact would occur (SB 100 is described in Section 3.7.1, *Regulatory Setting*). The same would be true of Alternatives 1 and 2.

See Section 3.7, *Energy*, for analysis of other energy-related considerations identified in CEQA Guidelines Appendix G Section VI.

3.1.4.7 Geology, Soils, and Paleontological Resources

According to CEQA Guidelines Appendix G Section VII(a)(1), a project would result in a significant impact to geology and soils if it would directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area. Neither the Project nor an alternative would cause an impact in this respect because no Alquist-Priolo Earthquake Fault Zones have been mapped as intersecting or adjacent to the Project Site. The closest mapped fault zones are located approximately 8.5 miles (Rocky Ledge Fault Zone) and 15 miles (the Hat Creek Fault Zone) from the Project Site. Accordingly, the Project would not directly or indirectly cause substantial adverse effects related to fault rupture. See Section 3.9, *Geology and Soils*, for additional analysis of potential impacts relating to geology and soils.

According to CEQA Guidelines Appendix G Section VII(f), a project would result in a significant impact to paleontological resources if it would directly or indirectly destroy a unique paleontological resource or site or unique geologic feature. Geologic mapping published by the CGS indicates a majority of the Project Site is underlain by two types of volcanic rock (i.e.,

[3] The California Green Building Standards Code (CALGreen, Title 24 Cal. Code Regs. Part 11) is a statewide regulatory code for all buildings. CALGreen is intended to encourage more sustainable and environmentally-friendly building practices, require use of low-pollution emitting substances that cause less harm to the environment, conserve natural resources, and promote the use of energy-efficient materials and equipment (CBSC, 2019).

andesite and basalt, which are discussed in Section 3.9.1.2, *Environmental Setting*). In general, rocks of igneous origins like volcanic rocks have low to no paleontological potential and sensitivity, due to the extremely high temperatures associated with the formation of the rocks and the nature of lava flows. Nonetheless, the online collections database of the University of California Museum of Paleontology (UCMP) was searched for fossil localities from geologic units mapped as occurring in the Project Site. Data provided through the UCMP's online database includes taxonomic identification, locality number and name, age, and county, and sometimes geologic formation. Precise locality data is not provided; however, in some cases the locality name can be used to further refine the general vicinity of the locality within the county. The results of this search indicate no previously recorded vertebrate fossil discoveries within the geologic formations within the Project Site (UCMP, 2020). For these reasons, implementation of the Project or Alternatives 1 or 2 would result in no impact to paleontological resources.

3.1.4.8 Hazards and Hazardous Materials

According to CEQA Guidelines Appendix G Section IX, a project would result in a significant impact to hazards and hazardous materials if it would: c) emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within 0.25 mile of an existing or proposed school; d) be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, create a significant hazard to the public or the environment; or e) for a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard or excessive noise for people residing or working in the project area. Neither the Project nor alternatives would result in any impact relative to these considerations.

There are no schools, existing or proposed, within 0.25 mile of the Project Site. The nearest school is Montgomery Creek Elementary School, which is located approximately 1.5 miles from the western boundary of the Project Site. The Project Site is not included on a list of hazardous materials sites compiled pursuant to the Cortese List (Government Code §65962.5). The nearest airport to the Project Site, the Fall River Mills Airport, is located approximately 20 miles northeast of the Project Site. Additionally, the Project Site is not located within an airport land use plan. For these reasons, the Project would cause no impact related to these considerations. The same would be true of Alternatives 1 and 2.

See Section 3.11, *Hazards and Hazardous Materials*, for analysis of other considerations identified in CEQA Guidelines Appendix G Section IX.

3.1.4.9 Hydrology and Water Quality

According to CEQA Guidelines Appendix G Section X, a project would have a significant impact to hydrology and water quality if it would: d) risk release of pollutants due to project inundation in flood hazard, tsunami, or seiche zones. Neither the Project nor alternatives would result in any impact relative to these considerations because the Project Site is not located in a flood hazard, tsunami, or seiche zone. Nor would the project become inundated in the event of a dam failure due to its elevation and location relative to the Haynes Reservoir, which is located approximately

3.3 miles northeast of the Project Site. In the unlikely event of a dam failure, projected inundation would extend north and down gradient, away from the Project Site. Therefore, there would be no impact pertaining to this criterion.

See Section 3.12, *Hydrology and Water Quality*, for analysis of other considerations identified in CEQA Guidelines Appendix G Section X.

3.1.4.10 Land Use and Planning

According to CEQA Guidelines Appendix G Section XI, a project would have a significant impact relating to land use and planning if it would: a) Physically divide an established community; or b) Cause a significant environmental impact due to a conflict with any land use plan, policy, or regulation adopted for the purpose of avoiding or mitigating an environmental effect. Neither the Project nor an alternative would have an impact in either respect.

The Project Site is privately-owned timberland located approximately 6 miles west of Burney, 35 miles northeast of Redding, and near the private recreational facility of Moose Camp.[4] Other communities near the Project Site include Montgomery Creek, Round Mountain, Wengler and Big Bend. None would be physically divided by the Project.

The Shasta County General Plan designates the Project Site as Timber (T). The zoning designations are Timber Production (TP) (approximately 4,457 acres) and Unclassified (U) (approximately 6 acres). Consistent with General Plan Policy 6.2.4, T-d, the proposed power generation facilities are an allowed use. Regarding the TP district, Shasta County Code Section 17.08.030(D) conditionally allows the construction of "gas, electrical, water, or communication transmission facility, or other public improvements, in accordance with Government Code Section 51152." Regarding the U zone district, Code Section 17.64.040, conditionally permits wind energy systems so long as the system is not otherwise prohibited by law and would not be inconsistent with any portion of the General Plan. Code Section 17.88.035 requires a Use Permit in all districts for all large scale wind energy facilities, like the Project, that would be larger than 50 kilowatts (Shasta County, 2019c). Consistent with Code Section 17.92.020, the Applicant has submitted a Use Permit application for the County's consideration. Consistency with other relevant General Plan policies and regulations adopted for the purpose of avoiding or mitigating an environmental effect are considered in the context of the relevant resource area elsewhere in this Chapter 3. For these reasons, no impact would result from the Project or from Alternative 1 or 2.

3.1.4.11 Mineral Resources

According to CEQA Guidelines Appendix G Section XII, a project would result in a significant impact to mineral resources if it would result in the loss of availability of: a) a known mineral resource that would be of value to the region and the residents of the state; or b) a locally-important

[4] Moose Camp is an approximately 146-acre private recreational facility owned and operated by Moose Recreational Camp, Ltd., a California Non-Profit Mutual Benefit Corporation, for the benefit of its approximately 75 members and their families (Moose Recreational Camp, Ltd., 2012a, 2012b; Appendix J, Scoping Report [Letters P17, P23, P37, P43, P55]). In Moose Camp, 50 cabin residences are used year-round (Appendix J, Letters P17, P23, P37, P43, P55).

mineral resource recovery site delineated on a local general plan, specific plan or other land use plan. Neither the Project nor alternatives would result in any impact relative to these considerations.

Neither the Project nor Alternatives 1 or 2 would be located within a significant mineral, oil, or gas resources area (DMG, 1997; DOGGR, 2020). Furthermore, local land use plans do not indicate presence of locally important mineral resources near the Project Site (Shasta County, 2004). Therefore, the Project and alternatives would not result in the loss of availability of a known mineral resource, nor would result in the loss of locally important mineral resource recovery site. Accordingly, the Project would have no impact related to mineral resources. The same would be true of Alternatives 1 and 2.

3.1.4.12 Noise

According to CEQA Guidelines Appendix G Section XIII(c), a project located in the vicinity of a private airstrip or an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport would result in a significant impact to noise if it would expose people residing or working in the project area to excessive noise levels. The nearest airport to the Project Site, the Fall River Mills Airport, is located approximately 20 miles to the northeast. Based on the distance between the two locations, neither the Project nor Alternative 1 or 2 would involve any activities in an airport land use compatibility plan area, and neither would have the potential to expose people residing or working on or near the Project Site to excessive noise levels generated by airport operations.

See Section 3.13, *Noise and Vibration*, for analysis of the other considerations identified in CEQA Guidelines Appendix G Section XIII.

3.1.4.13 Population and Housing, Growth Inducement

According to CEQA Guidelines Appendix G Section XIV, a project would result in a significant impact to population and housing if it would: a) induce substantial unplanned population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure); or b) displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere. Further, Section 15126.2(e) of the CEQA Guidelines suggests that an EIR discuss the ways that a proposed project could foster economic or population growth, or the construction of additional housing, in the surrounding environment because increases in the population may tax existing community service facilities, and thereby require the construction of new or expansion of existing facilities that could cause significant environmental effects. Projects are considered growth inducing, consistent with Section 15126.2(e), when they would remove obstacles to population growth. Growth inducement can be a result of new development that increases employment levels, removes barriers to development, or provides resources that lead to secondary growth. Neither the Project nor alternatives would result in any impact relative to these considerations.

The Project and Alternatives 1 and 2 would not induce substantial unplanned population growth in Shasta County either directly (e.g., by proposing new homes and businesses) or indirectly (e.g., by extending public roads or other infrastructure). No new homes are proposed as part of the

Project, and none would be removed. No one lives within the Project Site. Therefore, neither the Project nor an alternative would displace substantial numbers of existing people or housing, necessitating the construction of replacement housing elsewhere.

With respect to employment, the Project would require up to 400 on-site personnel, comprised of a combination of local and specialized (non-local) workers, during the projected 18- to 24-month construction period. The existing construction labor pool in Shasta County is sufficient to meet the Project's non-specialized labor needs.[5] Non-local workers would stay at local hotels and commute to the Project Site from Redding, Burney, Fall River Mills, or McArthur.[6] Operation and maintenance of the Project would require up to 12 full-time employees. Non-routine (emergency) maintenance could require additional workers. Decommissioning and site restoration activities are expected to require a smaller workforce than construction; decommissioning and site restoration-related activities are expected to take approximately 18- to 24-months to complete.

Because the operations and maintenance workforce would be small, and because the construction and decommissioning workforces would be temporary and include local workers, the Project would not cause substantial numbers of people to relocate to Shasta County. Therefore, the Project would not result in a large increase in employment levels that would significantly induce growth. Nonetheless, even if all workers were to migrate into Shasta County, the existing available housing supply could accommodate them without requiring new construction.[7] Therefore, the Project is not expected to induce population growth, the housing and provision of services for which could cause significant adverse environmental impacts. The same would be true of Alternatives 1 and 2.

Although as discussed in Section 3.7, *Energy*, the Project would contribute to the energy supply, which supports growth, the development of power infrastructure is a response to increased market demand, and the availability of electrical capacity by itself does not ensure or encourage growth within a particular area. Other factors such as economic conditions, land availability, population trends, availability of water supply or sewer services, and local planning policies have a more direct effect on growth.

3.1.4.14 Public Services

According to CEQA Guidelines Appendix G Section XV, a project would result in a significant impact to public services if it would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response

5 Shasta County comprises the Redding, California Metropolitan Statistical Area. The 2018 annual average unemployment rate in the Redding Metropolitan Statistical Area was 4.9 percent as compared to 4.2 percent for California and 3.9 percent for the nation during the same period (State of California Employment Development Department 2020; U.S. Department of Labor Bureau of Labor Statistics, 2019). While the number of construction jobs has been on the rise since 2011, it has not recovered to 2007/2008 levels (U.S. Department of Labor Bureau of Labor Statistics 2017). The number of individuals employed in the construction in the Redding Metropolitan Statistical Area in 2019 fluctuated from 3,000 in January, 2019 to 3,900 in July, 2019 (EDD, 2019).

6 A review of hotels in Burney, Fall River Mills, McArthur, and Redding using Google Travel indicated that there are 49 hotels and motels within the four towns (Google Travel, 2020).

7 Shasta County's vacancy rate for residential rentals is higher than the national average: 3.82 percent compared to 2.34 percent (Sperling's BestPlaces 2017).

times or other performance objectives for any of the public services: a) fire protection, b) police protection, c) schools, d) parks, or e) other public facilities. Neither the Project nor alternatives would require the construction of new or physical alteration of existing public services facilities. As explained below, no impact would result relative to these considerations.

Fire Protection Services

Fire control agencies in Shasta County operate at the federal, state, and local level. While State and Federal agencies are primarily tasked with responding to wildland fires, in practice, all agencies work together in times of need (Shasta County, 2018).

The U.S. Forest Service (USFS) is responsible for wildland fire control on Forest Service-administered lands and, pursuant to an agreement with the California Department of Forestry and Fire Protection (CAL FIRE), on approximately 200,000 acres of private lands adjacent to or within USFS boundaries. The National Park Service provides protection for Lassen National Park and Whiskeytown National Recreation Area (Shasta County, 2018).

CAL FIRE is responsible for wildland fire control on approximately 1.1 million acres of private lands outside of USFS or city boundaries. CAL FIRE protects an additional 250,000 acres of federal lands through an agreement with the USFS and Bureau of Land Management. There are five CAL FIRE Battalions in Shasta County. They support fire-fighting equipment and personnel with eight seasonal fire stations, and one Battalion with three additional stations that serve the County, although they are located outside its boundaries (Shasta County, 2018). Performance objectives for fire protection include the following:

1. According to the Shasta Trinity Unit 2018 Strategic Fire Plan, “CAL FIRE's goal is to contain 95 percent of all wildfires at 10 acres or less.” (CAL FIRE and Shasta County Fire, 2018).
2. According to CAL FIRE Chief Ken Pimlott, CAL FIRE’s statewide Initial Attack Fire Policy goal is to aggressively attack all wildfires, with the goal of containing 95 percent of all fire starts to 10 acres or less (NPR, 2018).

Local fire agencies serving the unincorporated areas of Shasta County include 12 community fire districts (including Burney), 19 volunteer fire companies (including Montgomery Creek), and one Shasta County Fire District station at the Redding Station 43. Several of the local fire agencies overlap with CAL FIRE and USFS jurisdictions. The Burney Fire Protection District provided initial input for the County’s environmental review process shortly after the Use Permit application was filed for the Project (Burney Fire Protection District, 2018). Later, in response to the issuance of notice of intention to prepare this Draft EIR, the County received scoping input noting that the California Office of Emergency Services (Cal OES) provides community support, including disaster response and recovery, and that the local community is served by a volunteer fire department (the Montgomery Creek Fire Company). All scoping input received, including regarding Public Services, is provided in Section 4.1 of the Scoping Report, a copy of which is provided in **Appendix J**, *Scoping Report*.

The Project and Alternatives 1 and 2 would result in no impact relating to the maintenance of acceptable performance objectives for fire protection services because they would not provide or

require the construction of new or physical alteration of existing governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for fire protection. As described in Section 3.18, *Wildfire*, the Project Site is within an area classified as a Very High Fire Hazard Severity Zone. As an example, the Fountain Fire destroyed approximately 600 structures in Round Mountain, Montgomery Creek, and the surrounding area and burned approximately 64,000 acres in 1992. A burn scar from that fire remains evident on the landscape within the Project Site. The Project could increase the demand for fire protection and response services due to the possibility that Project-related vehicles or infrastructure could ignite a fire. However, this increase in potential demand would be moderated by the proposed preparation of a Project-specific Fire Prevention Plan to be prepared consistent with the directives in the Shasta County Fire Safety Standards (Shasta County, 2017), the Forest Practice Rules (CAL FIRE, 2019), CAL FIRE's Shasta–Trinity Unit Strategic Fire Plan (CAL FIRE, 2017), and maintenance of adequate firebreaks and other fire prevention precautionary measures. Further, increases in long-term demand for fire protection services typically are associated with substantial increases in population, which would not occur as a result of the Project. See Section 3.1.3.6, *Population and Housing, Growth Inducement*. Because no new or modified fire protection facilities would be required, the Project would result in no impact relating to the construction of new or modification of existing governmental fire protection facilities.

Police Protection Services

Increases in long-term demand for police protection services typically are associated with substantial increases in population, which would not occur as a result of the Project. See Section 3.1.3.6, *Population and Housing, Growth Inducement*. The Project could cause an increase in the demand for police services associated with security issues during construction or decommissioning (e.g., theft of equipment or materials from the Project Site) or operation and maintenance (e.g., to police illegal trespassing). However, because the Project would be located entirely on private property and public access would be restricted by gates and posted "no trespassing" signs, any such increase in demand is not expected to be substantial and could be met by existing services. Therefore, there would be no need to modify existing, or provide new, police protection facilities to maintain acceptable performance objectives, the construction of which facilities could cause substantial adverse physical impacts. Because no new or modified police protection facilities would be required, the Project would result in no impact in this regard. The same would be true of Alternatives 1 and 2.

Other Public Services

Neither the Project nor Alternatives 1 or 2 would result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for other public services, including schools, parks, hospitals, or libraries. The Shasta County Office of Education supports 101 public schools, 17 public charter schools, and 19 preschools. Five public schools and two preschools are located within 20 miles of the Project Site, and two Head Start childhood education facilities are located within 10 miles of the Project Site. Regarding parks, the Big Bend Community Park, located

approximately 6.5 miles north of the Project Site, is the only developed community park within 20 miles of the Project Site. The hospital nearest to the Project Site is Mayers Memorial District Hospital, 20 miles northeast in Fall River Mills. Mayers Memorial Hospital provides essential hospital and emergency room care, as well as outpatient services. There is one public library within 20 miles of the Project Site. The Burney Branch Library is located approximately 6 miles east of the Project Site. As noted above, the Project would not result in an increase in the permanent population of the area. See Section 3.1.3.6, *Population and Housing, Growth Inducement*. Therefore, any Project workforce-generated demand on such facilities and services is likely to be part of the baseline condition and any temporary increase in population could be accommodated by existing or planned capacity within those systems and services. Because no new or modified schools, parks, hospitals, or libraries would be required, neither the Project nor Alternatives 1 or 2 would result in any impact regarding these public services.

3.1.4.15 Recreation

According to CEQA Guidelines Appendix G Section XVI, a project would result in a significant impact to recreation if it would: a) increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated; or b) include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment. Neither the Project nor Alternatives 1 or 2 would result in any impact relative to these considerations.

The Project and Alternatives 1 and 2 would not increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facility would occur or be accelerated because, as discussed above, the Project would not generate new residents in nearby communities or in the greater Shasta County area. Further, as described in Chapter 2, no recreational facility construction or expansion is proposed or would be required by the Project or alternatives. Accordingly, no impact would result to any of the significance criteria listed in CEQA Guidelines Appendix G Section XVI.

Although there are no parks on or in the immediate vicinity of the Project Site, scoping input suggests that the Project would affect areas that provide recreation based on swimming, hunting and fishing, hiking, biking, cross-country skiing, snowmobiling, and bird watching (Appendix J). The Project Site is private property. Indications of the landowner's intent to exclude the general public from the Project Site include fences, locked gates, and no trespassing signs. Because there is no right to trespass, the proposal to enforce restrictions of public access is not considered an impact to recreation as anticipated in CEQA Guidelines Appendix G Section XVI.

3.1.4.16 Utilities and Service Systems

According to CEQA Guidelines Appendix G Section XIX, a project would result in a significant impact to utilities and service systems if it would: a) require or result in the relocation or construction of new or expanded water, wastewater treatment or storm water drainage, electric power, natural gas, or telecommunications facilities, the construction or relocation of which could cause significant environmental effects; or b) fail to comply with federal, state, and local

management and reduction statutes and regulations related to solid waste. Neither the Project nor Alternatives 1 or 2 would result in any impact relative to these considerations.

See Section 3.17, *Utilities and Service Systems*, for analysis of other the utilities and service systems-related considerations identified in CEQA Guidelines Appendix G, Section XIX.

Water and Wastewater Treatment Facilities

Project Site clearing and construction would require water for dust control, batch concrete mixing, emergency fire suppression, and other activities. This water would be provided by a new on-site well(s) or would be delivered by a contractor using water trucks and sourced from an existing water right. The potential construction of one or more on-site wells and a septic system are included as part of the Project description and impacts are analyzed where appropriate throughout this EIR. Well construction would occur in accordance with the requirements of the water well permitting program administered by the Shasta County Environmental Health Division (EHD). Portable toilets would be provided for construction workers and would be serviced on a regular basis by a licensed contractor who would dispose of sanitary wastewater pursuant to applicable regulations. The Project would not connect permanently to any water or wastewater treatment facilities and would not result in the relocation or construction of new water or wastewater treatment facilities to serve direct Project-related demand that would have any impact not already addressed on a resource-by-resource basis in this EIR. As the construction workers are anticipated to be predominantly local and from the surrounding areas (i.e., Redding, Burney, Fall River Mills, or McArthur), the Project would not result in the need for additional wastewater treatment facilities in order to serve indirect Project-related demand. Therefore, the Project would not result in additional demand for wastewater treatment facilities and have no impact from construction of new wastewater facilities during construction. The same would be true of Alternatives 1 and 2.

Operation and maintenance of the Project would require water for the O&M facility, equipment maintenance and washing, and emergency fire suppression. The O&M facility would be served either by the onsite well, as discussed above, or by an onsite storage tank that would be filled periodically by water trucks from an existing water right. The O&M facility also would utilize an onsite septic system. The construction of storage tanks and an onsite septic system is included as part of the Project description and impacts are analyzed where appropriate throughout this EIR. Both the onsite storage tanks and septic system would be operated and maintained in accordance with the rules and regulations of the Shasta County Department of Resource Management's Environmental Health Division. The Project would not connect permanently to any water or wastewater treatment facilities and would not result in the relocation or construction of new water or wastewater treatment facilities to serve direct Project-related demand that would have any impact not already addressed on a resource-by-resource basis in this EIR.

The Project would not result in a permanent increase in the populations of local areas such as Redding, Burney, Fall River Mills, or McArthur. The Project would not result in the need for additional water or wastewater treatment facilities in order to serve indirect Project-related demand during operation and maintenance. Therefore, the Project would not result in additional demand for water or wastewater treatment facilities and have no impact from construction of new water or wastewater facilities during operation and maintenance.

Water and wastewater use during decommissioning would be limited to use for fire protection, dust suppression, and portable toilets. If a domestic well is installed during construction, operation, or maintenance, it would remain on-site. Decommissioning of the Project would not result in the construction or relocation of any additional permanent water or wastewater treatment facilities which could cause a significant environmental effect. Therefore, no impact would occur.

Storm Water Drainage Facilities

During site clearing and construction, the Project would maintain onsite stormwater drainage patterns to the extent possible to minimize impacts on runoff and drainage, but new storm water drainage facilities such as ditches and culverts would be constructed to capture and convey stormwater runoff. The construction of stormwater drainage ditches and culverts is included as part of the Project description and impacts are analyzed where appropriate throughout this EIR. As described in Section 2.4.5.6, *Stormwater Control*, the Applicant would prepare a site-specific Storm Water Pollution Prevention Plan (SWPPP) for the Project that would identify best management practices (BMPs) to be used to minimize or eliminate pollution, erosion, and sedimentation during road construction. The Applicant also would prepare a Temporary Erosion and Sediment Control (TESC) Plan, which would be implemented and maintained by the construction contractor throughout operation to further reduce the potential for erosion. For more information regarding the SWPPP or the TESC Plan, see Section 3.12, *Hydrology and Water Quality*. The Project would not create a new connection to any stormwater drainage system and would not result in the relocation or construction of new stormwater drainage facilities due to an increase in runoff from the site. No impact would result.

Decommissioning of the Project would involve removal of turbines, support towers, transformers, substation, switching station, and foundations. No new access roads or road widening would be required. Therefore, decommissioning of the Project would not result in the relocation or the construction of any new stormwater drainage facilities. Under this criterion, there would be no impact.

Electric Power and Telecommunications Facilities

The Project would include site clearing for and construction of 34.5 kV overhead (approximately 12 miles) and underground (approximately 51 miles) collector lines, fiber optic communication cabling, an onsite substation, a switching station, and four permanent Meteorological Equipment (MET) towers. Additionally, a relay microwave tower or overhead fiber optic communication circuits could be required as part of the interconnection facilities. These electrical power and telecommunication facilities are part of the Project description and are analyzed where appropriate throughout this EIR. Construction of other Project components would not result in the need for additional electric power or telecommunication facilities. Therefore, no impact would occur during construction.

Operation and maintenance of the Project would use electrical power supplied by the connections installed during construction as described above. No additional electrical power or telecommunication facilities would be constructed or relocated during operation and maintenance; therefore, no impact would occur.

Decommissioning of the Project would result in removal of all facilities listed above (i.e., overhead and underground collector lines, relay microwave tower, fiber optic cabling, substation, switching station, and MET towers). The decommissioning phase of the Project would not result in any need for additional construction or relocation of new electric power or telecommunication facilities. Under this criterion, there would be no impact.

In response to its notice of intention to prepare this Draft EIR, the County received scoping input asking whether existing electrical infrastructure is adequate to transmit electricity to be generated by the Project reliably and safely once it hits the Round Mountain station operated by PG&E. It is suggested that these lines are at or over electrical capacity during peak times 7 months or more of the year. The County is aware of a Round Mountain 500 kV Area Dynamic Reactive Support project that is being considered as part of the California Independent System Operator's transmission planning process (CAISO, 2019a, 2019b) to maintain reliability for the transmission system in response to increasing variable loading on the transmission system and in anticipation of retiring the Diablo Canyon nuclear power plant in 2025. The County anticipates that the CPUC would analyze the potential environmental impacts of any transmission reliability work proposed to take place in connection with the Round Mountain Substation once sufficient details about such a proposal are known. That project would be proposed many miles away from the Project Site and would have a different applicant, a different CEQA lead agency, and different objectives than the Project analyzed in this EIR. It is anticipated that any reliability upgrades that could be proposed in connection with the Round Mountain substation would be evaluated whether or not the Project proceeds. Although overall electrical system capacity and issues of grid reliability are beyond the scope of the County's consideration under CEQA of impacts of the proposed wind project, the County further notes that a regional grid reliability project at or near the Round Mountain Substation appears to be proceeding (TransmissionHub, 2020).

Natural Gas Facilities

No new or relocated natural gas facilities are proposed or would be required for construction, operation and maintenance, or decommissioning of the Project or Alternatives. Therefore, no impact would result regarding the relocation or construction of such facilities.

Regulatory Compliance and Solid Waste

No federal regulations governing solid waste apply to the Project, so there would be no impact to federal statutes and regulations related to solid waste. As discussed in connection with Impact 13.7-3 in Section 3.17, *Utilities and Service Systems*, the Project would be consistent with both the Forest Practice Act of 1973 regarding non-biodegradable waste, as well as the California Green Building Standards Code regarding biodegradable waste. The Project also would comply with the Shasta County EHD regarding disposal of solid waste. Therefore, there would be no impact as the Project would comply with all federal, State, and local management regulations related to solid waste. The same would be true of Alternatives 1 and 2.

3.1.4.17 "Wind Turbine Syndrome"

Scoping comments identified an unspecified condition called "wind turbine syndrome" as having the potential to cause sleep disturbance, headaches, tinnitus, a sense of quivering or vibration, dizziness, nausea, nervousness, high blood pressure or rapid heartbeat, difficulty with concentration, memory loss, irritability and anger, and seizures (Appendix J).

The term "Wind Turbine Syndrome" was coined by a pediatrician in 2009 in a report that hypothesized that wind turbines generating low frequency sound cause a multitude of symptoms, such as headache and dizziness. An article in the *Journal of Environmental Health* (Roberts and Roberts, 2013) summarizes the study method used in the 2009 report (i.e., a collection of subjective responses from 37 participants interviewed by phone) and summarized peer-reviewed literature examining the relationship between human health effects and exposure to sound generated from the operation of wind turbines. The journal article concluded that "exposure to wind turbine sound and the mere presence of wind turbines" can cause a significant annoyance response among study participants, but that no specific health condition has been documented in the peer-reviewed literature that has been classified as a disease caused by exposure to sound levels and frequencies generated by the operation of wind turbines (Roberts and Roberts, 2013). An article in the May–June 2016 volume of *Neurotoxicology and Teratology* (a bimonthly peer-reviewed scientific journal) also investigated the possibility of an association between residential proximity to wind turbines and symptoms of unknown or uncertain origin (Blanes-Vidal and Schwartz, 2016). This article also reports having found no observed significant relationship between residential proximity to wind turbines and symptoms complained of. That symptoms may be attributed to something other than the wind turbines also is suggested by an article published in *Health: An Interdisciplinary Journal for the Social Study of Health, Illness and Medicine* (a bimonthly peer-reviewed scientific journal): "In the research interviews examined, even though interviewees treat those who report experiencing symptoms from wind farms as having primary rights to narrate their own experience, this epistemic primacy does not extend to the ability to 'correctly' identify symptoms' cause. As a result, the legitimacy of health complaints is undermined. Wind turbine syndrome is an example of a contested illness that is politically controversial." (Clark and Botterill, 2018).

With regard to annoyance from wind turbines, the County of San Diego Public Health Office authored a Public Health Position Statement in 2019 that contained a systematic and comprehensive look at claims of adverse health impacts from wind turbines. The Public Health Position Statement states that there is a convincing body of evidence to show that annoyance is strongly related to visual cues and attitude as well as the wind turbine noise itself. "In particular, this was highlighted by the fact that people who benefit economically from wind turbines (e.g., those who have leased their property to wind farm developers) reported significantly lower levels of annoyance than those who received no economic benefit, despite increased proximity to the turbines and exposure to similar (or louder) sound levels" (County of San Diego, 2019). The "body of evidence" referenced by the 2019 Position Statement includes studies by the Minnesota Department of Public Health, Maschke, Havas, the Danish Energy Agency, Niemann, the World Health Organization, and the National Research Council.

Based on the current state of the science, this EIR does not consider potential impacts relating to "Wind Turbine Syndrome" in further detail because: (a) there is no agreement among scientists that Wind Turbine Syndrome is a risk to human health, (b) there are no defined or adopted CEQA standards for defining health risk from wind turbine–generated sound, and (c) the County has determined that the potential for health effects associated with "wind turbine syndrome" as characterized in scoping comments is too speculative to allow for a meaningful evaluation of potential impacts.

3.1.5 Irreversible Impacts

Section 15126.2(d) of the CEQA Guidelines requires an EIR to consider whether a proposed project, if implemented, would result in significant irreversible environmental changes. Such changes are likely to occur for example, following the dedication of a large commitment of non-renewable resources because "a large commitment of such resources makes removal or nonuse thereafter unlikely." Secondary impacts (such as highway improvements, which provide access to a previously inaccessible area) generally commit future generations to similar uses.

For the Fountain Wind Project, the use permit period ultimately would be established by County decision-makers; a 40-year permit duration has been requested. Upon the expiration of the use permit period, the Project would be decommissioned and the Project Site restored to a condition suitable for commercial timber land use (see Section 2.4.7, *Decommissioning and Site Restoration*). Internal roads that would not be needed to serve the future timber land use of the site would be removed and the area restored, including by natural recruitment. Therefore, the Project-specific commitment of non-renewable resources (e.g., oil, gas, and other fossil fuels) would not preclude the removal of Project infrastructure or the site's future use in a way that is comparable to its current use. Irreversible impacts also can result from damage caused by environmental accidents caused by a proposed project (CEQA Guidelines §15126.2[d]). Potential impacts relating to hazards and hazardous materials are analyzed in Section 3.11, which identifies no significant unavoidable adverse effect. For these reasons, the Project would not, if implemented, result in significant irreversible impacts.

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3.2 Aesthetics

This section identifies and evaluates issues related to Aesthetics in the context of the Project and alternatives. It includes information about the physical and regulatory setting and identifies the criteria used to evaluate the significance of potential impacts, the methods used in evaluating these impacts, and the results of the impact assessment. The information and analysis presented in this section are based in part on the Visual Resources Technical Report provided in **Appendix A**, *Aesthetics*. The County independently reviewed this and other materials prepared by or on behalf of the Applicant and determined them to be suitable for reliance on (in combination with other materials included in the formal record) in the preparation of this Draft EIR.

The County received scoping input about aesthetic and visual resources. All scoping input received, including regarding aesthetic and visual resources, is provided in Section 4.1 of the Scoping Report, a copy of which is provided in **Appendix J**, *Scoping Report*.

3.2.1 Visual Concepts and Terminology

Individuals' values, familiarity with a landscape, concern for a landscape, or interpretation of scenic quality can lead to varying individual determinations of scenic quality and varying individual responses to changes made to a landscape. Due to unique individual attachments to values for a particular landscape, visual changes will inherently affect viewers differently. However, general assumptions can be made about viewer sensitivity to scenic quality and visual changes. For the purpose of this analysis, visual or aesthetic resources are defined as both the natural and built features of the landscape that contribute to the public's experience and appreciation of a given environment. Definitions of the following terms and concepts are provided in order to aid the readers' understanding of the content in this section. The following definitions are adapted slightly from the Federal Highway Administration *Guidelines for the Assessment of Highway Projects* (FHWA, 2015).

Visual Character is a description of the visible attributes of a scene or object typically using artistic terms such as form, line, color, and texture.

Visual Resources can be either natural visual resources such as land, water, and vegetation. Visual Resources that are primarily geological or biological in origin are considered natural.

Cultural Visual Resources can include buildings structures, and artifacts. Generally, visual resources that are manmade are considered cultural visual resources. Land, water, and vegetation may contribute to the importance of cultural visual resources.

Visual Quality is defined as the overall visual impression or attractiveness of an area as determined by the particular landscape characteristics, including landforms, rock forms, water features, and vegetation patterns. The attributes of line, form and color combine in various ways to create landscape characteristics whose variety, vividness, coherence, uniqueness, harmony, and pattern contribute to the overall visual quality of an area. Different viewers may evaluate visual resource differently depending on their interests in natural harmony (generally harmony is considered

desirable; disharmony is undesirable), cultural order (orderly is considered desirable; disorderly is undesirable) and project coherence (coherent is considered desirable; incoherent is undesirable).

Viewer Exposure addresses the variables that affect viewing conditions from potentially sensitive areas. Viewer exposure considers the following factors:

- Landscape visibility (i.e., the ability to see the landscape)
- Viewing distance (i.e., the proximity of viewers to the Project)
- Viewing angle – whether the Project would be viewed from above (superior), below (inferior), or from a level line of sight (normal)
- Extent of visibility – whether the line of sight is open and panoramic to the Project area or restricted by terrain, vegetation and/or structures
- Duration of view

Viewer Types and Volumes of use pertain to the types of use (e.g., public viewers including recreationalist and motorist) and amounts of use (e.g., number of recreational users or motorists) that various land uses receive. Generally, recreational users are expected to be highly concerned with scenery and landscape character whereas people who commute through a landscape daily to work are expected to have a lower concern for visual, scenic quality.

Visual Sensitivity is the overall measure of an existing landscape's susceptibility to adverse visual changes. People in different visual settings, typically characterized by different land uses surrounding a project, have varying degrees of sensitivity to changes in visual conditions depending on the overall visual characteristics of the place. In areas of more distinctive visual quality, such as designated scenic highways, designated scenic roads, parks, and recreation and natural areas, visual sensitivity is characteristically more pronounced. In areas of more indistinctive or representative visual quality, sensitivity to change tends to be less pronounced, depending on the level of visual exposure. This analysis of visual sensitivity is based on the combined factors of visual quality, viewer types and volumes, and visual exposure to the Project. Visual sensitivity is reflected according to high, moderate, and low visual sensitivity ranges.

Definitions for the following terms also are provided as they are used to describe and assess the aesthetic setting and impacts from the Project and alternatives.

Color is the property of reflecting light of a particular intensity and wavelength (or mixture of wavelengths) to which the eye is sensitive. It is the major visual property of surfaces.

Contrast is the opposition or unlikeness of different forms, lines, colors, or textures in a landscape. The contrast can be measured by comparing the project features with the major features in the existing landscape.

Form is the mass or shape of an object or objects which appear unified.

Vividness is the strength of memorability of the visual impression created by the visual elements that create the visual character of a landscape.

Unity is the degree to which the visual resources and elements of the landscape join to form a coherent, harmonious visual pattern.

Intactness refers to the integrity of visual order in the natural and human-built environment.

Texture is the visual manifestations of the interplay of light and shadow created by the variations in the surface of an object or landscape.

Line is the path, real or imagined, that the eye follows when perceiving abrupt differences in form, color, or texture. Within landscapes, lines may be found as ridges, skylines, structures, changes in vegetative types, or individual trees and branches.

Landscape Unit refers to an area with similar visual features, a homogenous visual character, and frequently a single viewshed, or "seen" area.

A ***Key Observation Point (KOP)*** is a viewpoint selected for use in a visual impact analysis because it is either critical or representative of the visual character of either the environment of the project. KOPs for this Project are shown in **Figure 3.2-1**, *Project Location, Visual Resources, and Key Observation Points.*

Character Views are not relied upon in the formal visual analysis as a KOP but rather serve to supplement discussions of existing visual character.

Scenic vista is an area that is designated, signed, and accessible to the public for the purposes of viewing and sightseeing.

A ***scenic highway*** is any stretch of public roadway that is designated as a scenic corridor by a federal, state, or local agency.

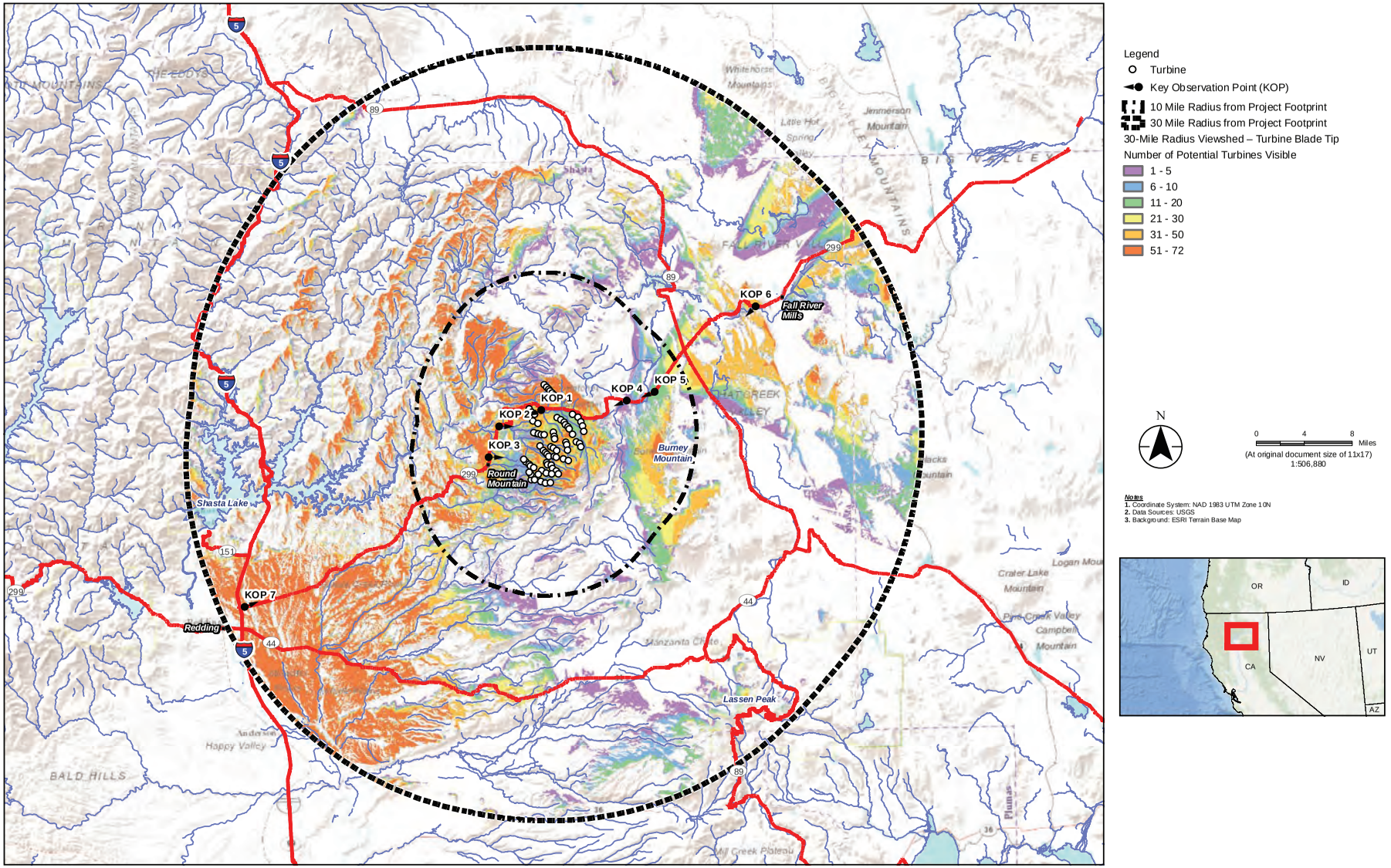
Sensitive receptors or sensitive viewpoints include individuals or groups of individuals that have views of a site afforded by a scenic vista, scenic highway, residence, or public recreation area.

The ***viewshed*** for a project is the surrounding geographic area from which the project is likely to be seen, based on topography, atmospheric conditions, land use patterns, and roadway orientations.

3.2.2 Setting

3.2.2.1 Study Area

The study area for this visual resources analysis is consistent with the study area defined in the Visual Resources Technical Report. i.e., the presumed maximum viewshed for the Project, including the areas within which the Project is likely to be seen, and the areas of presumed or known visual concern. As an example, for an on-shore, utility-scale wind energy project, the viewshed is typically the area within a 10- to 20-mile radius of the Project. The topography of the region (a mountainous project location with valley regions both east and west of the Project Site and elevated areas with direct lines of sight to the east) and the size of the Proposed turbines could result in a greater amount of visibility of the Project and, therefore, a larger theoretical



SOURCE: Stantec

Fountain Wind

Figure 3.2-1
Project Location, Visual Resources, and Key Observation Points

viewshed than for other wind projects. Additionally, scoping comments received from the public discussed the long range views available from the Sacramento Valley of the Project Site and mountains to the east. As a result, the study area was increased to include a 30-mile radius from the Project Site for this analysis.

Within this 30-mile radius, the landscape character varies widely based on the topography, landscape character, and land uses. Therefore, within the Visual Resources Technical Report, three distinct landscape units were defined in order to inform a selection of viewpoints which are representative of diverse views within the study area. These landscape units include the Mountain Communities, Hat Creek and Pit River, and Sacramento Valley.

3.2.2.2 Environmental Setting

This section discusses the environmental conditions related to aesthetics within the study area defined above. It summarizes setting information provided in Appendix A. Information in the appended technical report is re-ordered within this section to flow geographically west to east. Therefore, the numbering of some KOPs and Character Views is not presented sequentially.

Representative Viewpoints

Visual resource specialists from Stantec Consulting Services, Inc. (Stantec) conducted two site visits where they collected photographs of the Project Site from 37 viewpoints including viewpoints from representative or visually sensitive areas within the study area. Photographs from additional viewpoints were collected to account for potentially sensitive receptors and views identified as particularly sensitive during the public scoping period. From this set of 37 viewpoints, Stantec then coordinated with Shasta County to identify seven views that are representative of the range of viewer sensitivities, landscapes, and land uses in the Project viewshed. Appendix G of the CEQA Guidelines suggests that an aesthetics analysis analyze impacts to public views, and defines public views as "those that are experienced from publicly accessible vantage points." Consistent with CEQA's focus on potential impacts to the public at large rather than to individual members of the public, and consistent with the definition provided in the CEQA Guidelines, the seven viewpoints selected for more detailed consideration in the technical report represent publicly accessible views and locations; they do not assess visual impacts to private views. The locations of each of these seven KOPs are demonstrated on Figure 3.2-1 and in other figures that have been brought forward from the technical report with naming intact for ease in cross-referencing should readers elect to refer to Appendix A for additional detail. To view the 7 KOP locations, see **Figure 3.2-2**, *Character Views 5 and 6*, and **Figure 3.2-3**, *Character Views 1 and 2*. Additionally, from the 37 viewpoints originally photographed, Stantec identified views from six locations in the different landscape units that represent the visual character typical of views within each landscape unit.

Environmental conditions include the regional and local visual environment organized according to the distinct landscape units described above- the Sacramento Valley, Mountain Communities, and Hat Creek and Pit River area. Other components of environmental conditions include sources of light and glare within the Project Site; sensitive visual receptors; visual quality of the study area; KOPs selected to determine existing environmental conditions; and to assess impacts of the

Character View 5: View from eastbound SR 299, just east of Bella Vista. Urban and suburban development, rangelands, foothills, and mature trees are typical of the visual character east of Redding. Hatchet Ridge Wind project turbines are faintly detectable along the ridgeline in the left side of the view.

Character View 6: View from Hilltop Drive facing east, just east of I-5 in Redding. Burney Mountain is visible in the right side of the view, approximately 41 miles away. Hatchet Ridge Wind turbines are detectable along the ridgeline in the left of the view, approximately 36 miles away.

SOURCE: Stantec

Fountain Wind

Figure 3.2-2
Character Views 5 and 6

Character View 1: View along eastbound SR 299, approaching Hatchet Summit from the west. Hatchet Ridge Wind project turbines are visible to the northeast; however, most views from the highway corridor are obstructed by trees.

Character View 2: View along westbound SR 299, near the community of Johnson Park and just east of the SR 299 / SR 89 junction. Trees line the highway corridors throughout this area, which narrows or eliminates views to the west.

SOURCE: Stantec

Fountain Wind Project

Figure 3.2-3
Character Views 1 and 2

Project and alternatives. This environmental setting section and the following analysis analyze the existing visual quality and potential Project impacts to views from publicly accessible viewpoints and does not consider the impacts to private views or the views from individual residences. **Table 3.2-1**, *Key Observation Points*, outlines the three landscape units, the KOPs located in each landscape unit, typical viewers at each KOP, and the distance from each KOP to the Project Site.

TABLE 3.2-1
KEY OBSERVATION POINTS

Landscape/KOP	Distance from Nearest Project Turbine (miles)	Visual Resources	Typical Viewer
Mountain Communities			
KOP 1	0.8	Designated overlook just off of SR 299	Residents, tourists
KOP 2	3.1	Elementary school	Residents, tourists, commuters, workers
KOP 3	3.1	Hill Country Clinic/ Community Center	Residents, tourists, commuters, workers
KOP 4	4.5	Rural mountain landscape	Tourists, commuters, workers
KOP 5	7.1	Main population center east of Project	Residents, tourists, commuters, workers
Hat Creek and Pit River			
KOP 6	18.6	Eligible State Scenic Highway	Recreationists, tourists, commuters
Sacramento Valley			
KOP 7	27.8	Main population center west of project	Residents, tourists, commuters, workers

Ownership in the surrounding Trinity and Cascade ranges is a mix of both private and public ownership including both state and national forest land. Land uses in this area primarily consist of timber production, rangeland, open space and recreation, and rural land uses. Designated recreation areas in the area include McArthur-Burney Falls (approximately 12.5 miles from the Project Site) and Ahjumawi Lava Springs State Parks (approximately 26 miles from the Project Site), Lassen Volcanic National Park (approximately 21.5 miles from the Project Site), Whiskeytown-Shasta-Trinity National Recreation Area (approximately 35 miles from the Project Site), and the Pacific Crest National Scenic Trail (approximately 21 miles from the Project Site).

Viewer Sensitivity

Residential Viewers

Residential neighbors live within viewing distance of the Project. The visual preferences of residents tend toward a desire to maintain the existing landscape as it is. Depending on their location, residential neighbors often are interested in cultural order and natural harmony with less emphasis on project coherence unless it affects their ability to appreciate the other two aspects of visual quality.

Recreational viewers

Recreationalists may participate in organized activities, indoor or outdoor leisure activities or cultural activities. The visual preference of recreationalists tends to be focused on and associated with their recreational activity. They tend to prefer the status quo and are leery of visual encroachments that may cause adverse effects on the setting of their activity. Depending on the type of recreation, recreational neighbors are very interested in cultural order and natural harmony, with some emphasis on project coherence as it affects their experience traveling to their recreational activity.

Tourists

Tourists travel on a highway, primarily for enjoyment usually to a pre-determined destination. Tourist trips tend to be more adventuresome, cover longer distances, and take more time than commuting trips. Tourists frequently travel in groups with both a driver and passenger(s), and are equally interested in project coherence, cultural order, and natural harmony.

Workers

Viewers of a project can include agricultural neighbors, timber workers, or construction workers who spend time outside. Some workers are permanent; many are migratory but may return to the same area again and again over the years. Outdoor workers regard cultural order and natural harmony as critical components of the landscape. They are less interested in project coherence.

Commuters

Commuters are regular travelers of the same route. The frequency of the travel may vary, but there tend to be peaks- such as morning and evening rush hours and holidays. Commuters, like all travelers are particularly interested in project coherence. They are also interested in cultural order and natural harmony to the extent that it contributes to wayfinding.

With regard to viewer sensitivity, residents, recreationists, and tourists are assumed to have moderately high to high sensitivity to visual change, based on the context of specific views. Workers and commuters are assumed to have more moderate sensitivity to visual change.

Sacramento Valley Character

The Project Site is located in rural, unincorporated Shasta County, approximately 28 miles northeast of Redding. Within the region, Redding is the largest city at the northern end of the Sacramento Valley, approximately 26 miles southwest of the Project Site. Communities in the region generally are located along the main transportation routes of Interstate 5 (I-5) and State Route (SR) 299. The major north-south route in the region is I-5, a four-lane divided highway located approximately 28 miles west of the Project Site. SR 299 runs east to west from the valley floor into the Cascade Range, climbing in altitude as it passes through the foothills into the mountains. The City of Redding area has a relatively flat topography and includes primarily a mix of commercial/institutional development in the downtown area west of the Sacramento River and mix of commercial development in the central business district east of the river. The outer ring region of both downtown and central business district is developed primarily with single-family

residential development. Surrounding communities in the valley (such as in the greater Anderson, Redding, and Shasta Lake areas, Cottonwood, and Palo Cedro) consist of a mix of rural agricultural, residential, commercial and industrial development. The community of Bella Vista is located east of Redding in the transitional foothills between the valley and the Cascade Mountains. Development in Redding and the surrounding area includes built features such as structures, and vertical and linear features such as light poles, transmission lines, and roadways. These features occasionally block views of the surrounding foothills and mountains.

Due to the low elevation of the valley floor, views of the Cascade Range and Trinity Mountains are available from Redding and the surrounding areas. From many locations in urban Redding, views to the east are blocked by structures and vegetation; however, from some locations in urban Redding, the mountains to the east can be seen as a mostly uninterrupted skyline with rangelands and foothills in the foreground (see Figure 3.2-2, *Character View 5*). The Hatchet Ridge Wind Project turbines are faintly visible from along the ridgeline in these views. Visual character within this landscape unit is defined by the urban and suburban development surrounding Redding and the ridgelines and forms of surrounding mountains.

Redding is the largest population center near the Project Site, and viewer types present in the landscape unit including residents, workers, travelers, and commuters. Views toward the Project within this landscape unit would primarily be brief and intermittent along roads. More sustained views within this landscape unit may be accessible for pedestrians or cyclists traveling east along roadways or from stationary locations such as parks.

KOP 7 is located within the Sacramento Valley and represents views from Redding toward the Project Site, located 28 miles to the east. The viewpoint is located along a bike path near the eastbound lanes of SR 299, just under 0.5 mile east of I-5. Nearby neighborhoods are obscured by dense trees. Built features such as signage, light poles, and transmission and distribution lines, roads and other development. Sources of nighttime lighting in this view would include the Hatchet Ridge turbines, light poles, surrounding development, and cars traveling on SR 299 and I-5. Views such as those represented by KOP 7 would primarily be experienced by residents, workers, and travelers and commuters.

Mountain Communities Character

This landscape unit includes the portion of the study area between the foothills east of Bella Vista and SR 89 east of the Project Site. The Project Site is located entirely within this landscape unit. The Lassen National Forest is located southeast of the Project Site while the Shasta-Trinity National Forest is to the north. Other surrounding lands are privately owned. Many are used for timber harvesting purposes. The Project Site is located near the private recreational facility of Moose Camp in which approximately 75 members use 50 cabin residences year-round. Because Moose Camp and the leasehold area in which the Project Site is located are privately owned, publicly accessible views are not available from these areas. Most of the project vicinity is densely forested with pine, mixed conifer, fir forests, montane chaparral, and forest scrub which limits views of surrounding areas.

From the valley to the Cascade Range to the east, the mountains become larger, the vegetation transitions to mixed conifer forests, and the topography transitions to a mix of steep ridges, buttes, and peaks separated by small valleys. Small, rural communities such as Round Mountain, Montgomery Creek, and Burney are located intermittently along SR 299. SR 299 winds through these communities and offers intermittent views of the mountains and valleys. The densely vegetated areas of the forest are interrupted by burn scars from fires, timber clearcuts, and nearby rural communities. Depending on the location of the viewer, views range from enclosed due to the topography and vegetation to expansive views of rolling vegetated mountains in the foreground to snowcapped peaks in in distance. Views from publicly accessible locations near the Project Site contain ridgelines and slopes of varying grades with partial to complete coverage of evergreen trees. Dispersed residences are visible between communities and managed timberlands and lumber manufacturing facilities and associated infrastructure and roads are visible between towns. The existing Hatchet Ridge turbines are visible along the ridgelines from various vantage points throughout this landscape unit (see Figure 3.2-3, *Character Views 1 and 2*). Sources of nighttime lighting include surrounding rural development, traffic along SR 299, and the safety lighting on the existing Hatchet Ridge turbines.

Within the Mountain Communities landscape type, the visual character is defined by ridgeline forms visible above and beyond vivid evergreen trees. Human elements such as linear roadways, utility poles, transmission corridors, timber operations and the wind turbines also shape the visual character and introduce an element of contrast with the otherwise natural environment. Typical viewers within this landscape unit include tourists who may be seeking out vista views or traveling to recreational destinations as well as commuters, workers, and residents within the region. Views in this landscape unit would primarily be brief and intermittent as travelers drive through the landscape along SR 299. The designated Fountain Fire Overlook (KOP 1) provides sustained, contemplative views. Additionally, informal pullouts along SR 299 and other community resources such as schools and community centers may provide sustained views.

KOP 1 through KOP 5 are located within this landscape unit. KOP 1, the Fountain Fire Overlook, is a designated viewpoint commemorating the 1992 Fountain Fire which burned approximately 64,000 acres in the area. The majority of the land visible from this KOP is privately owned and there is active logging in the area. The types of development visible to viewers from this KOP include managed timberland and associated roads and infrastructure comprise the majority of development between towns and communities.

KOP 2 in Montgomery Creek and KOP 3 in Round Mountain are representative of views to the east from the western slopes. These locations provide intermittent views of the nearby ridgelines and developed communities. Certain portions of SR 299 are located in areas where more expansive views are available as shown in KOP 4. However, most views along SR 299 in this region are enclosed by trees and structures. The views shown in KOP 5, located in Burney, demonstrates the presence of intervening elements from an urbanized environment.

Hat Creek and Pit River Character

This landscape unit includes the portion of the study area east of SR 89. The visual character of this landscape unit is characterized by the contrast between the Hat Creek Valley and the peaks

and buttes located to the east and west, see **Figure 3.2-4**, *Character Views 3 and 4*. Within the Valley, Hat Creek flows to the north through the flatlands and into the Pit River. Approximately 11 miles from the Project Site, views to the west are blocked by Burney Mountain and other ridgelines. Higher elevations within the valley provide broader views to the west, represented by KOP 6, an informal lookout along Haney Mountain approximately 19 miles from the Project Site. The varied topography of the region is visible within views from KOP 6. The Hatchet Ridge turbines are discernable along the ridgeline in the distance. An electrical transmission corridor extends into the background. Sources of nighttime lighting in the landscape unit include traffic along SR 299 and SR 89 and rural development.

Within this landscape unit, travelers, residents, commuters, recreationists and workers are common typical viewers. Popular recreational locations near this landscape unit include Hat Creek and Pit River, the Volcanic Legacy Scenic Byway, the Pacific Crest National Scenic Trail between McArthur-Burney Falls Memorial State Park and Lassen Volcanic National Park. Views within this landscape unit would primarily be brief as viewers travel along SR 299. Longer, more sustained views would be available from pullouts along SR 299 and SR 89.

3.2.2.3 Regulatory Setting

Federal

Federal Aviation Administration Regulations on Objects Affecting Navigable Airspace

The Federal Aviation Administration (FAA) is the federal agency that identifies potential impacts related to air traffic and related safety hazards. The FAA's Federal Aviation Regulations (FAR) at 14 CFR Part 77 establish standards and notification requirements for objects affecting navigable airspace. This notification serves as the basis for evaluating the effect of the proposed construction or alteration on operating procedures; determining the potential hazardous effect of the proposed construction on air navigation; identifying mitigating measures to enhance safe air navigation; and charting of new objects. FAA standards and Advisory Circular 70/7460-1L (FAA, 2018) govern the marking and lighting of obstructions that have been deemed to be a hazard to air navigation. In general, any temporary or permanent structure, including appurtenances, that exceeds an overall height of 200 feet (61 m) above ground level (AGL) meets the requirements to be marked and/or lighted. This would include the proposed meteorological evaluation towers (METs) and wind turbines. The lighting and marking standards in Advisory Circular 70/7460-1L were developed specifically to reduce potential impacts on migratory bird populations (FAA, 2018).

State

California State Scenic Highway Program

In 1963, the California Legislature created the Scenic Highway Program to protect scenic highway corridors from changes that would diminish the aesthetic value of lands adjacent to the highways. A highway may be designated as "scenic" depending on how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the travelers' enjoyment of the view. The Scenic Highway System includes highways that are either eligible for designation or have been designated as such. There

Character View 3: View from Cassel Road facing southwest, east of SR 89 and Hat Creek, one of few locations with unobstructed views to the west. Burney Mountain is visible in the left side of the view. The Project would be approximately 12 miles away from this location. The row of trees beyond the Hat Creek sign are typical of view obstructing vegetation along SR 89.

Character View 4: View from Big Valley Point Summit facing southwest, east of Fall River Mills. Burney Mountain is approximately 27 miles away and is visible in the left of the view. Saddle Mountain and Haney Mountain are approximately 13 miles away and are visible in the right of the view, appearing above the Fall River Valley.

SOURCE: Stantec

Fountain Wind

Figure 3.2-4
Character Views 3 and 4

is only one designated state scenic highway in Shasta County: a 3.3-mile segment of SR 151 extending south from Shasta Dam which is located 28 miles from the western edge of the Project Site. Eligible State Scenic Highways include SR 89 from the Siskiyou County border to its intersection with SR 44 (at its closest approximately 11 miles from the Project Site), SR 299 west of I-5, and east of SR 89 (runs through the Project Site), and SR 44 from I-5 to its intersection with SR 89 (Caltrans, 2019).

Local

Shasta County General Plan

The Scenic Highways element of the Shasta County General Plan is intended to establish and protect state or county roads with scenic value. The element defines the term "scenic highway" as any freeway, highway, road, street, or boulevard which traverses an area of unusual scenic quality. The element also defines the area that is easily visible from a scenic highway or road as a "scenic corridor." The scenic highways element also defines unique features which define the visual quality of scenic corridors:

- **Focal points** – prominent natural or man-made features which immediately catch the eye.
- **Transition areas** – locations where the visual environment changes dramatically.
- **Gateways** – locations which mark the entrance to a community or geographic area

Figure SH-1 in the Scenic Highways element identifies such scenic highways and features. It shows Hatchet Ridge Summit on SR 299 as designated a "gateway." Additionally, SR 299 from Bella Vista east to the Hatchet Ridge Summit gateway and SR 44 from Old Station to Millville each is considered a "corridor in which the natural environment is dominant." SR 299 from the Hatchet Ridge Summit gateway to Burney is considered a "corridor in which natural and manmade environment contrast." I-5 from the City of Shasta Lake north to the County border is considered a "corridor in which the natural environment is dominant" (Shasta County, 2004).

Shasta County has developed the following objectives and policies to protect the visual quality of scenic highways and corridors within the County.

> **Objective SH-1:** Protection of the natural scenery along the official scenic highways of Shasta County from new development which would diminish the aesthetic value of the scenic corridor.
>
> **Objective SH-2:** New development along scenic corridors of the official scenic highway should be designed to relate to the dominant character of the corridor (natural or natural and man-made contrast) or of a particular segment of the corridor. Relationships shall be achieved in part through regulations concerning building form, site location, and density of new development.
>
> **Objective SH-3:** Recognition that the management practices of agriculture, timber, and other resource-based industries which may cause some degradation of the visual quality of the scenic corridor are inevitable but their impacts are temporary.
>
> > ***Policy SH-a*:** To protect the value of the natural and scenic character of the official scenic highway corridors and the County gateways dominated by the natural environment, the

following provisions, along with the County development standards, shall govern new development:

- setback requirements
- regulations of building form, material, and color
- landscaping with native vegetation, where possible
- minimizing grading and cut and fill activities
- requiring use of adequate erosion and sediment control programs
- siting of new structures to minimize visual impacts from highway
- regulation of the type, size, and location of advertising signs
- utility lines shall be underground wherever possible; where undergrounding is not practical, lines should be sited in a manner which minimizes their visual intrusion.

***Policy SH-b*:** The type, size, design, and placement of signs within an official corridor shall be compatible with the visual character of the immediate surroundings. The County's sign regulations should be redrafted for the following locations:

- timberlands and forest areas
- croplands and grazing lands
- rural community centers
- urban and town centers
- recreational uses

***Policy SH-c*:** Official scenic highways should include vista sites, turnouts, restrooms, picnic grounds, travel information, and other related facilities/services.

Shasta County Zoning Ordinance

Section 17.84.050 of the Shasta County Zoning Ordinance outlines requirements for outdoor lighting as follows: "All lighting, exterior and interior, shall be designed and located so as to confine direct lighting to the premises. A light source shall not shine upon or illuminate directly on any surface other than the area required to be lighted. No lighting shall be of the type or in a location such that constitutes a hazard to vehicular traffic, either on private property or on abutting streets."

3.2.3 Significance Criteria

A project would have a significant impact to Aesthetics if it would:

a) Have a substantial adverse effect on a scenic vista or substantially degrade the existing visual character or quality of public views of the site and its surroundings from publicly accessible vantage point.

b) Substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway;

c) Create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area.

CEQA Guidelines Appendix G Section I suggests, "In non-urbanized areas," a project would have a significant effect on the environment if it would "substantially degrade the existing visual character or quality of public views of the site and its surroundings." Public views are defined for purposes of this inquiry as "those that are experienced from publicly accessible vantage point." A different consideration is suggested if a project would be located in an urbanized area. The Project is not proposed to be located in an area that meets the CEQA definition of "urbanized" (Pub. Res. Code §21071); therefore, the analysis below focuses on the potential for the Project or an alternative to substantially degrade the existing visual character or quality of public views. Because the analysis of visual character and quality informs adverse effects on scenic vistas and vice versa, the analysis for CEQA Guidelines Appendix G Section I checklist criteria a) and c) are considered together in this analysis.

The degree of visual impact depends on how noticeable the adverse change is in conjunction with the visual sensitivity of the site. An adverse visual impact may occur when: (1) an action perceptibly changes the existing physical features of the landscape that are characteristic of the region or locale; (2) an action introduces new features to the physical landscape that are perceptibly uncharacteristic of the region or locale, or become visually dominant in the viewshed; or (3) an action blocks or totally obscures valued aesthetic features of the landscape. The noticeability of a visual impact is a function of the Project features, context, and viewing conditions (angle of view, distance, and primary viewing directions). The key factors in determining the degree of visual change are visual contrast, project dominance, and view blockage.

Visual Contrast. Visual contrast is a measure of the degree of change in line, form, color, and texture that a project would create, when compared to the existing landscape. Visual contrast ranges from "none" to "strong," and may be defined as:

- None –The element contrast is not visible or perceived;
- Weak –The element contrast can be seen but does not attract attention;
- Moderate –The element contrast begins to attract attention and begins to dominate the characteristic landscape; or
- Strong – The element contrast demands the viewer's attention and cannot be overlooked.

Project Dominance. Visual dominance is a measure of a project feature's apparent size relative to other visible landscape features in the viewshed.

View Blockage or Impairment. View blockage or impairment is a measure of the degree to which a project's features would obstruct or block views of aesthetic features due to the project's position and/or scale.

Overall Adverse Visual Impact. Overall adverse visual impact is determined by the change in visual quality that would be introduced by a project. While generally a greater change in the visual quality of landscape would result in a greater visual impact, the degree of visual impact is also affected by the viewer type and sensitivity. Viewers types that are more sensitive to visual change may experience a greater visual impact from a given change in visual quality.

3.2.4 Direct and Indirect Effects

3.2.4.1 Methodology

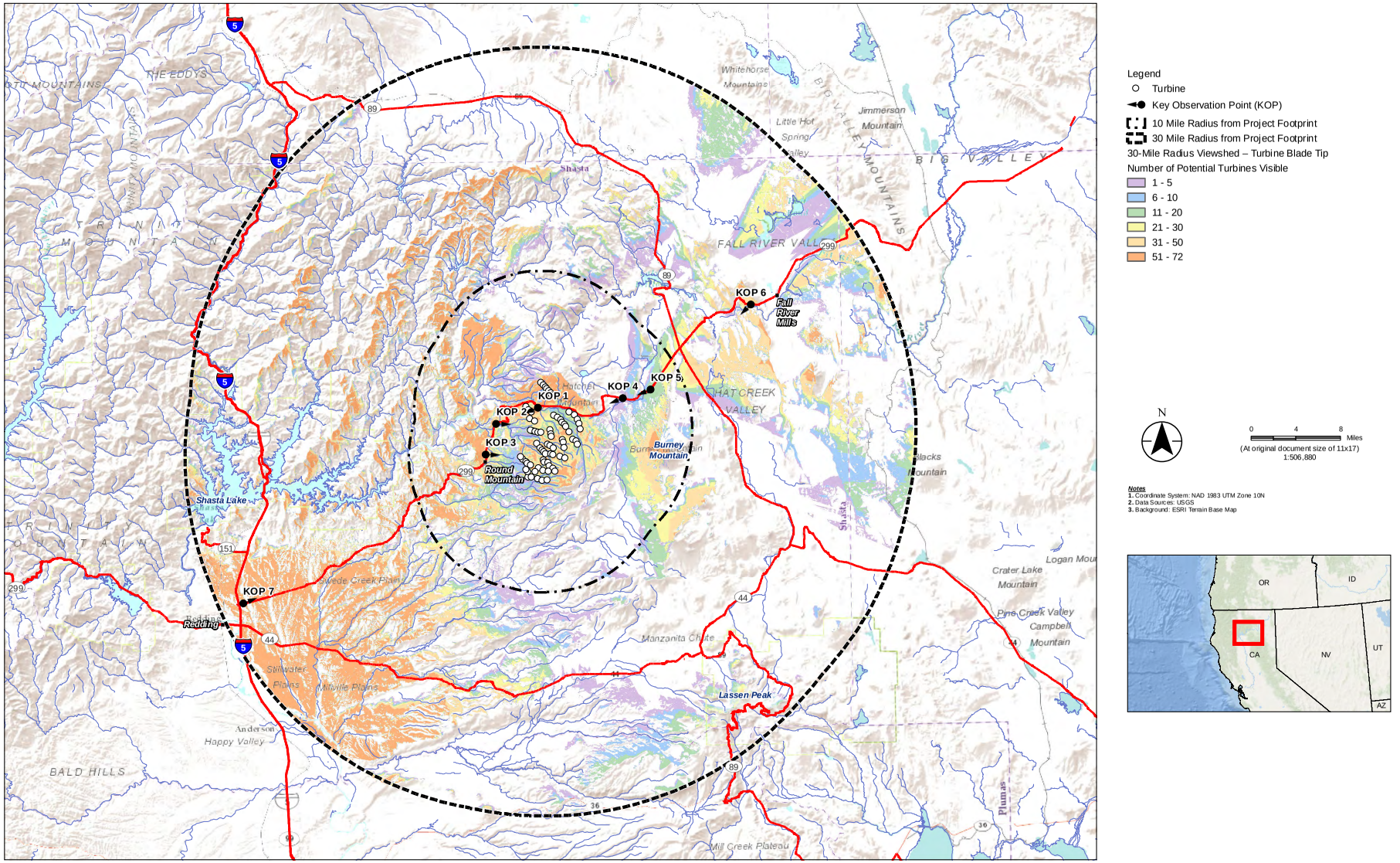
Visual Resources Technical Report

This section summarizes the methodology used in the Visual Resources Technical Report (Appendix A) to analyze the Project's impacts to visual quality. The viewshed analysis used to select representative views and KOPs is described in Section 3.2.2.3, *Environmental Setting*. Appendix A provides additional discussion of the methodology used.

The Visual Resources Technical Report conducted a viewshed analysis using geographic information system (GIS) mapping to identify the visibility of the Project based on the height of proposed components and the surrounding topography. A viewshed analysis was conducted for the study area (i.e., within a 30-mile radius of the Project Site) as well as a 10-mile radius in order to define where the turbines would be visible at a scale not allowed by the 30-mile zone. This analysis was performed to determine from what locations the tip blades of turbines would be visible (see **Figure 3.2-5**, *30-Mile Radius Viewshed Turbine Blade Tip*) and from what locations the turbine hubs would be visible (see **Figure 3.2-6**, *30-Mile Radius Viewshed Hub Height*).

Visual simulations were created for each of the seven KOPs by placing a photo-realistic model of the Project into existing photographs. These simulations serve as the basis for evaluating the contrast between existing conditions and the conditions introduced by the Project. The Project is proposed entirely within forested lands that are actively managed for timber production. Additional parts of the Project (such as ancillary structures and overhead electrical collector lines and corridors) would be located within privately owned parcels and set back from publicly accessible locations. These components generally would be obscured by the surrounding forest and the topography in views toward the Project Site from outside viewing locations and, as analyzed below, would not substantially alter existing views. For these reasons, the analysis in the Technical Report focused on the visual effects of the proposed turbines. The analysis of Project operations in this section also focuses on the visual impacts of proposed turbines. The only Project component that would be visible from the viewing locations selected is the turbines; therefore, the simulations include only the proposed turbines. Long distance views also were included in the simulations to reflect the visibility of the Project from I-5 and Redding. More information about how these long-distance simulations were created can be found in Appendix A.

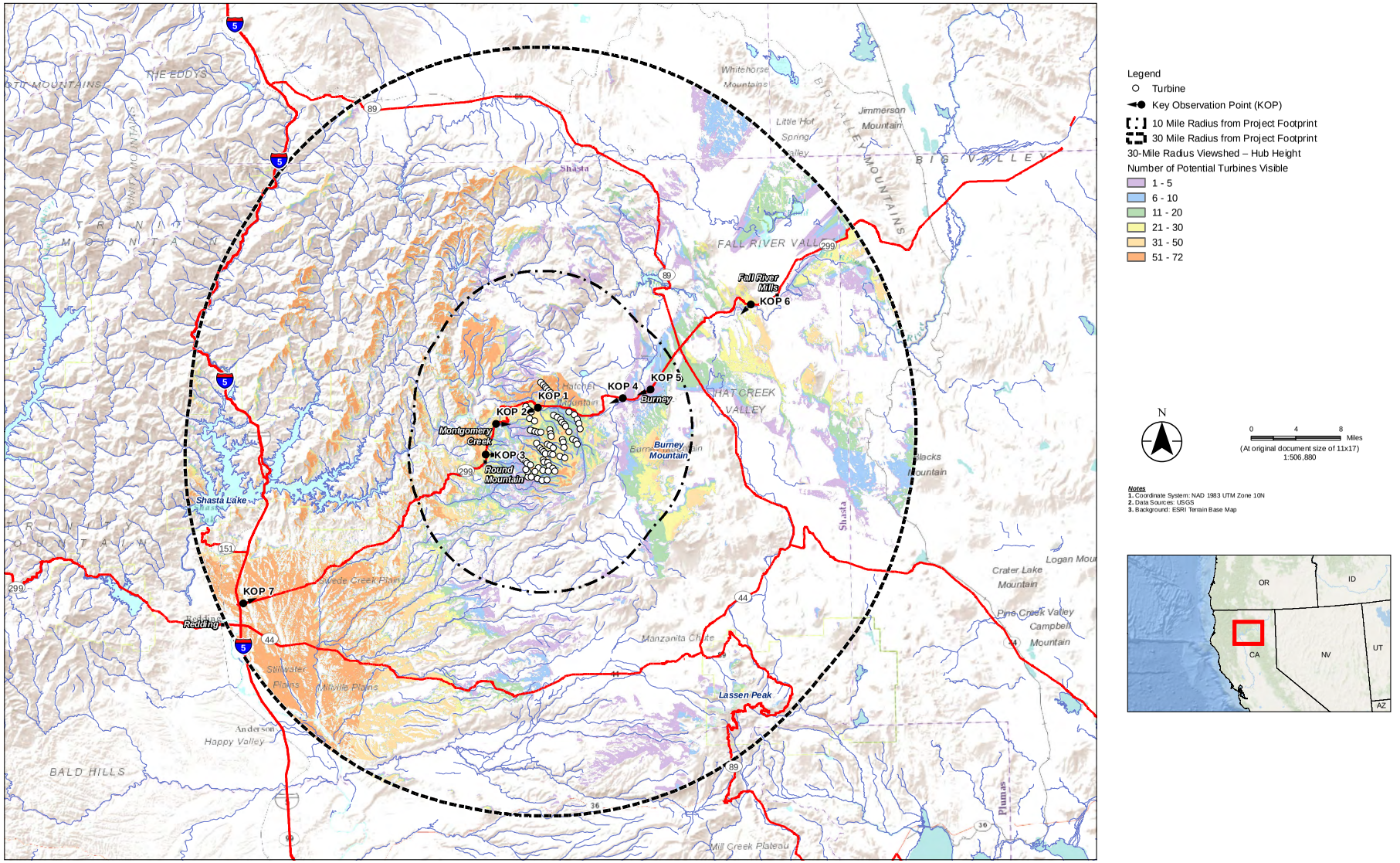
These simulations as well as on-site observations provided the basis for the evaluation of changes in visual quality for each KOP. The assessment of potential effects to visual resources relies on the methodology established by the Federal Highway Administration (FHWA) Visual Impact Assessment (VIA) for Highway Projects. The assessment relied on the FHWA worksheets which evaluates the natural harmony, cultural order, overall coherence, and landscape composition and vividness for each view. This assessment assigns a visual quality rating from "very low" to "very high" for each view for existing conditions and for simulated images showing existing conditions with the Project in place. The change in the visual quality rating for each view between existing and proposed conditions indicates the degree of contrast and visual change that would be introduced by the Project.



SOURCE: Stantec

Fountain Wind

Figure 3.2-5
30-Mile Radius Viewshed Turbine Blade Tip



SOURCE: Stantec

Fountain Wind

Figure 3.2-6
30-Mile Radius Viewshed Hub Height

ESA

Visual Impact Analysis

This visual impact assessment identifies and assesses any potential short- or long-term adverse visual impacts on Aesthetics and visual resources that could result from implementation of the Project The visual impact assessment included the following steps:

- Identifying Project components that could affect representative views in the study area in terms of visual quality, character, and levels of light and glare, as informed by plans, descriptions, and simulations provided by the Applicant;
- Visiting the Project Site. EIR Preparers visited the Project Site and surrounding area in June 2018, January 2019, and February 2019. Experience from these visits informed the understanding of baseline visual conditions as well as the County's independent review of the technical report provided by the Applicant.
- Assessing the Project's impacts to identified views by evaluating potential Project-caused change in the affected area's baseline visual quality, character, scenic vistas, designated scenic highways, and sources of light and glare using the visual simulations and analysis provided in the technical report. In addition to analyzing the impacts to individual viewpoints, this analysis evaluates the visual impacts of the Project as a whole.

3.2.4.2 Direct and Indirect Effects of the Project

a) Whether the Project would have a substantial adverse effect on a scenic vista or substantially degrade the character or visual quality of views from publicly accessible vantage points.

Impact 3.2-1: The Project would, unless mitigated, have a substantial adverse effect on a scenic vista or substantially degrade the character or visual quality of views from publicly accessible vantage points. (*Significant and Unavoidable*)

The Project would be located in unincorporated Shasta County. The General Plan does not identify specific scenic vistas. Therefore, the Project would have no impact on scenic vistas designated in planning documents. However, while there are no designated scenic vistas within Shasta County, there are numerous formal and informal areas from which public views of the surrounding areas are accessible. Therefore, consideration of this potential impact focuses on the potential impact that the Project would have on these public vistas and visual character and quality. Nighttime lighting is discussed in this section as it relates to impacts on scenic vistas and general degradation of visual character and quality. However, a more detailed discussion of the impacts of glare and nighttime lighting is discussed under significance criterion c).

Project construction would require grading, vegetation and timber clearing, the operation of equipment, and the delivery and staging of equipment and turbine components. Decommissioning would require the operation of heavy equipment, the dismantling of turbine structures, and restoration of the Project Site. Equipment and vehicles traveling to the Project Site would be visible from SR 299 and locations such as KOP 1, similar to existing traffic from timber hauling trucks and traffic along SR 299 is visible from these locations. The deliveries and vehicles associated with Project construction and decommissioning may result in a short-term increase in the frequency of large delivery trucks along SR 299; however, this increase would not create a long-term substantial change in existing visual conditions as Project construction is expected occur over 18–24 months

and the Project would result in a 25 percent increase in traffic volume on SR 299 during peak am and pm hours, see Section 3.14, *Transportation*, for more information.

Unlike the turbines, which would extend above the tree line and be visible from surrounding vantage points, the majority of construction and decommissioning activities would not be visible from publicly accessible locations. The majority of construction and decommissioning activities would occur within the privately owned leasehold area, as discussed in Section 3.2.4.1, *Methodology*. Construction and decommissioning activities, each lasting approximately 24 months, that would be set back approximately 800 feet from SR 299 and screened by forested areas adjacent to SR 299. While activities during these periods would result in temporary adverse visual impacts due to the short-term increase in traffic and large delivery trucks along SR 299, as well as the potential for increased presence of dust in and around the Project Site (see Section 3.3, *Air Quality*). The impacts would be of short duration and would not represent a substantial change from existing conditions. Therefore, aesthetic impacts from construction and decommissioning would be less than significant.

To analyze potential impacts during the operation and maintenance period, the technical report uses the FHWA methodology to evaluate potential Project-caused changes relative to specified publicly accessible locations throughout the landscape units. The seven selected KOPs represent areas of potential Project visibility and visual sensitivity and were chosen as viewpoints which would be representative of the visual change that would be experienced from publicly accessible locations where the Project is visible. Visual simulations were created and analyzed to compare the view vividness, intactness, and unity to existing conditions without the Project to assess the change in visual quality that would be introduced by the Project.

Before and simulated after views from each KOP are provided in the figures that follow. All Project components would be located within privately owned parcels, set back a minimum of 800 feet from publicly accessible locations, and generally obscured by the forest and topography from views toward the Project from outside the Project Site. Therefore, this analysis focuses on the proposed turbines, which would extend above the forested areas and be visible from publicly accessible locations. Vegetation clearance would be required for the overhead electrical lines and access road improvements. Vegetation clearance could result in the creation of linear, man-made features within forested hills that could be visible from some locations. This vegetation clearance would create a level of visual contrast compared to existing conditions. However, due to the presence of existing cleared transmission line rights of way associated with Hatchet Ridge and other electrical lines as well as areas cleared for timber harvests, the introduction of linear vegetation clearance associated with the Project would not create a substantial amount of visual contrast when compared to existing conditions.

The following discussion summarizes the overall visual change that would be introduced by the Project. The KOP-level analysis describes the visual change at each representative viewpoint, but does not make CEQA conclusions. A discussion of the overall CEQA impact to scenic vistas follows the KOP level discussion. A detailed discussion of potential effects on vistas, visual character and visual quality for each KOP also is discussed. From KOP 1, 2 and 3, turbines are not visible in existing (baseline) views. Therefore, the introduction of Project turbines could

create a substantial source of visual contrast due to the strong, vertical/angular forms, light smooth texture of the turbines, and the motion of turbines. The features would create contrast with existing skylines which currently appear undeveloped aside from built features such as transmission towers in some views. The impact of the turbine towers to visual quality would depend on the proximity of the viewer. For example, from KOP 1, just two turbines would be visible, but the proximity of the viewer to the turbines would result in the turbines being a dominant feature from KOP 1. In certain views, such as from KOP 4 and KOP 5, the Hatchet Ridge Wind Project turbines would be visible; therefore, the proposed turbines would reinforce an existing element of the landscape character as they would similar in form, color, and texture to the existing turbines.

KOP 1: Fountain Fire Overlook

KOP 1 is representative of views experienced by tourists traveling through the area on SR 299 and is intended to represent views of nearby residents traveling along Moose Camp Road. This vista point has signage and parking. Typical viewers at this location (tourists and residents) are assumed to have a moderately high to high sensitivity to visual change. While travelers or tourists passing by this location on SR 299 would experience this view briefly, more sustained views would be experienced by tourists, recreationists, or residents who stop at the Fountain Fire Overlook.

As described in Section 3.2.2.3, *Environmental Setting*, the visual character of KOP 1 is defined by distinct, flat, uninterrupted ridgeline and homogenous forested vegetation. The existing visual quality at the Fountain Fire Overlook is moderately high. The uniformity of the forest landscape creates a high degree of natural harmony, coherence, and landscape composition and vividness (see **Figure 3.2-7**, *KOP 1, Fountain Fire Overlook*). As shown, two Project turbines would be visible from KOP 1, creating straight, vertical white structures (turbine towers, hubs, and blades would be visible) along an otherwise uninterrupted ridgeline. The proximity of the viewer to the turbines would make the turbines dominant within views from KOP 1. The turbines would have an adverse impact on the visual character of the site by interrupting the straight line and dominant form of the ridgeline with vertical forms and introducing smooth white colors which contrast with the evergreen colors dominant in existing views.

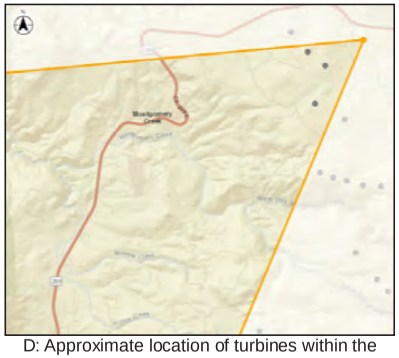
The purpose of the Fountain Fire Overlook is to create an accessible area for viewers to learn about and contemplate the Fountain Fire and associated reforestation efforts. The dominance of the turbines would become the view's most memorable component, detracting from the intended purpose of the vista point. Therefore, the Project would have an adverse effect on the Fountain Fire Scenic Vista. In this view, the turbines would dominate views and attract the focus of viewers, detracting from the natural harmony of the existing views. The turbines do not relate to any other existing structures within the view and; therefore, would reduce the overall coherence of the view and the landscape composition and vividness.

Additionally, although vegetation would partially screen nighttime views, nighttime lighting on turbines would be highly visible from this KOP. Although views from this KOP would primarily be experienced during daytime hours, views of turbine lighting would be unavoidable and would be enhanced by the proximity of the turbines to the KOP. The Project's reduction in the view's harmony, coherence, cultural order, and vividness would reduce visual quality at KOP 1 from

A: View to the west-southwest from the Fountain Fire Overlook, located along Moose Camp Road, just south of SR 299. A temporary meteorological tower is visible in the right side of the view.

B: View from KOP 1 with Project simulated. Proposed turbines would be visible just under one mile away, in the center of the view.

C: Existing view from KOP 1 (outlined) within broader context.



D: Approximate location of turbines within the 40-degree horizontal field of vision represented in the above view.

Specifications
Location: 40°51'47.50"N, 121°51'1.23"W
View Direction: West-Southwest
Date & Time: 18 April 2019, 10:38 a.m.
Camera Focal Length: 50 mm
Camera Make / Model: 5DsR
Photo Source: Stantec
Number of Proposed Turbines: 2

SOURCE: Stantec

Fountain Wind

Figure 3.2-7
KOP 1: Fountain Fire Overlook

ESA

moderately high to moderately low. In summary, the Project would have an adverse impact to scenic vistas from KOP 1, the visual character, and visual quality of KOP 1. KOP 1 is representative of views from scenic vista points where the proposed turbines would be in close proximity and would impose on an otherwise uninterrupted skyline.

KOP 2: Montgomery Creek

KOP 2 is located near the entrance of the Montgomery Creek School and is intended to be representative of views in the Montgomery Creek area. Viewers from this KOP would include Montgomery Creek residents, who would have relatively static or sustained views from the community, and tourists who would have brief views while traveling eastward along SR 299. Both viewer types would have moderately high to high sensitivity to visual change. Commuters and workers (assumed to have a moderate sensitivity to visual change) also would briefly see this KOP while traveling along SR 299. Views from KOP 2 are not considered scenic vistas because there is no designated signage or place intended for the public to experience a scenic vista and the view as seen from KOP 2 is typical of built mountain communities. Therefore, the following analysis focuses primarily on the Project's potential to degrade the character or visual quality of views from KOP 2 as a publicly accessible vantage point.

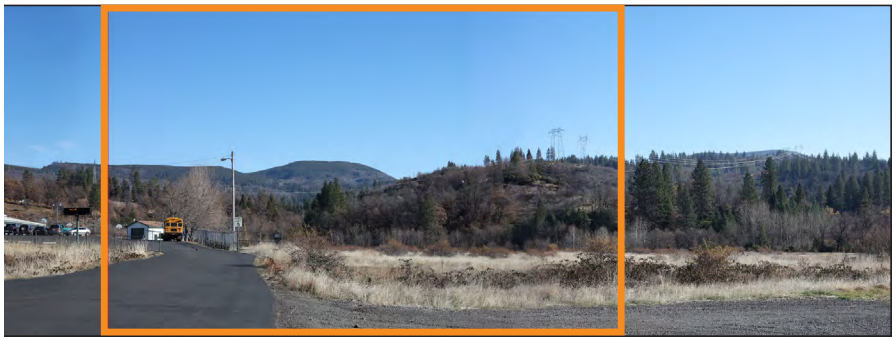
Existing visual character visible from KOP 2 is defined by an undeveloped ridgeline in the background and a hill which extends from the middle to the right side of the view. Built features such as the paved entry way to the elementary school, structures and vehicles associated with the elementary school, and a transmission line and light pole introduce elements of development into the KOP. As shown in **Figure 3.2-8**, *KOP 2, Montgomery Creek*, views from KOP 2 show overlapping ridges, in the middleground and the background. Linear man-made features such as roads, light poles, and power lines are present in the middleground. Views from KOP 2 have a moderate level of natural harmony and cultural order and show a representative mix of ridgelines and development typical of the area. The overall coherence and landscape composition and vividness of views from KOP 2 is low due to the contrast of built features in the foothills. The overall visual quality of views from KOP 2 under existing conditions is moderate and representative of views along the highway with undeveloped hills and mountains in the background interrupted by transmission or distribution facilities.

As shown in Figure 3.2-8, six of the proposed turbines would be visible along the furthest ridgeline. Turbines would appear at varying heights behind the ridgeline and turbine towers, hubs, and blades would be visible above the ridgeline. The visible turbines would introduce straight, vertical forms, white, smooth colors, and motion into an otherwise undeveloped ridgeline introducing new colors and forms into existing views. While the turbines would alter the visual character in views from KOP 2, the change in visual character would be somewhat consistent with the pattern of existing development in views from KOP 2.

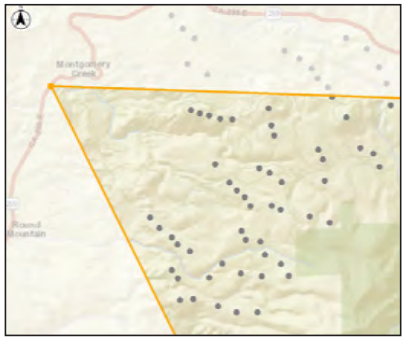
The Project would not alter the level of natural harmony in views from KOP 2. With regard to cultural order, the Project turbines would be visible, but there would be no discernible pattern to the turbines visible from KOP 2 resulting in a decrease in the cultural order of views. The addition of the turbines would be somewhat consistent with existing presence of transmission towers and would balance out the presence of the transmission towers. However, the turbines

A: View to the east from the entrance to Montgomery Creek Elementary School off of SR 299.

B: View from KOP 2 with project simulated. Turbines would be most visible in the left side of the view, between 3 and 5 miles away.



C: Existing view from KOP 2 (outlined) within broader context.



D: Approximate location of turbines within the 40-degree horizontal field of vision represented in the above view.

Specifications
Location: 40°50'34.57"N, 121°55'20.54"W
View Direction: East
Date & Time: 13 December 2018, 2:18 p.m.
Camera Focal Length: 50 mm
Camera Make / Model: 5DsR
Photo Source: Stantec
Number of Proposed Turbines: 10

SOURCE: Stantec

Fountain Wind

Figure 3.2-8
KOP 2: Montgomery Creek

would create new unique, moving forms along the ridgeline and would draw the attention of viewers. The overall visual quality of views from KOP 2 would be reduced from moderate to moderately low. Safety lighting on the turbines would be visible along the ridgeline and would introduce nighttime lighting where no nighttime lighting currently is visible. In summary, the views from KOP 2 are not considered to be scenic vistas; therefore, there would be no impact to scenic vistas at KOP 2. The turbines visible from KOP 2, however, would have an adverse impact on visual character and would reduce the visual quality from moderate to moderately low.

KOP 3: Round Mountain

KOP 3 is located in and is representative of views from the community of Round Mountain. Typical viewers at this KOP would include residents of Round Mountain and tourists (assumed to have a moderately high sensitivity to visual change) and commuters and workers (assumed to have a moderate sensitivity to visual change). The Hill Country Clinic and Community Center is near this KOP. The duration of views for tourists or commuters at this KOP would be short, but not momentary or intermittent. The duration of views for Round Mountain residents would be sustained. Views from KOP 3 are not considered scenic as there is no designated signage or place intended for the public to experience a scenic vista and because the view is representative of the existing community. Therefore, the following analysis focuses primarily on the potential for the Project to degrade the character or visual quality of views from KOP 3 as a publicly accessible vantage point.

As shown in **Figure 3.2-9**, *KOP 3, Round Mountain*, views from KOP 3 are similar to views from KOP 2. Under existing conditions, visual character at KOP 3 is defined by an extended, rounded and articulate ridgeline in the background and rural development in a narrow valley the middleground. Under existing conditions, no structures interrupt the skyline. Built features such as power lines, transmission towers, power lines, fence lines, and roads introduce linear, man–made features which traverse the view, partially blocking the ridgeline in the background. The visual character; therefore, is defined by the form of the forested ridgeline in the background and the infrastructure and development in the foreground.

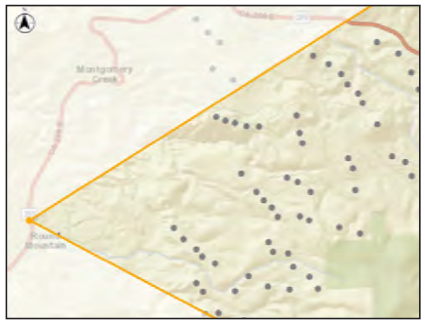
Similar to the views from KOP 2, existing visual quality of the view from KOP 3 is moderate. Under baseline conditions, the natural harmony of views is moderate due to the strong, defined ridgeline in the background which is interrupted by transmission towers. The collection of transmission towers and rural residences reduces the cultural order of views to a moderately low level. Similarly, the contrast between the ridgeline and the transmission towers and houses result in a moderately low level of coherence and a moderate level of landscape composition and vividness. As a result, the overall visual quality of views from KOP 3 is moderate.

The Project would introduce a number of turbines atop the ridgeline. The turbines would be visible at various heights resulting in varying visibility of turbine towers, nacelles, and blades. Project turbines would extend above the ridgeline, interrupting the currently undisturbed skyline. The Project would result in changes to the visual character of views at KOP 3. While the turbines would add an element of visual interest to views from KOP 3, they would also extend the components of linear development in existing conditions above the ridgelines. Grey and white colors and vertical forms would attract the focus of viewers and diminish the visual character of the existing ridgeline.

A: View to the east from the Round Mountain Post Office, just south of the Hill Country Community Clinic.

B: View from KOP 3 with project simulated. Project turbines would be visible between 3 and 6 miles away.

C: Existing view from KOP 3 (outlined) within broader context.



D: Approximate location of turbines within the 40-degree horizontal field of vision represented in the above view.

Specifications
Location: 40°48'11.94"N, 121°56'24.44"W
View Direction: East
Date & Time: 13 December 2018; 3:18 p.m.
Camera Focal Length: 50 mm
Camera Make / Model: 5DsR
Photo Source: Stantec
Number of Proposed Turbines: 13

SOURCE: Stantec

Fountain Wind

Figure 3.2-9
KOP 3: Round Mountain

While the Project would introduce white, vertical structures which would result in an interruption in the skyline, the Project would not reduce the level of natural harmony or cultural order, as it would create consistency with existing infrastructure in views. The addition of turbines to views from KOP 3 would result in electrical infrastructure being a dominant part of the view. This would reduce the overall coherence and landscape composition and vividness. The Project would reduce the overall visual quality from KOP 3 from moderate to moderately low. Due to the amount of mature vegetation and the location of the highway within the mountain valley, views of Project infrastructure would be intermittent, but would draw the attention of viewers. Additionally, due to the height of the turbines above the ridgeline, nighttime safety lighting would be visible and unobstructed in views from KOP 3. In summary, while the Project would not impact a scenic vista from KOP 3, the visual character of views from KOP 3 would be adversely affected. Additionally, the visual quality of views from KOP 3 would be reduced from moderate to moderately low.

KOP 4: SR 299 at Tamarack Road

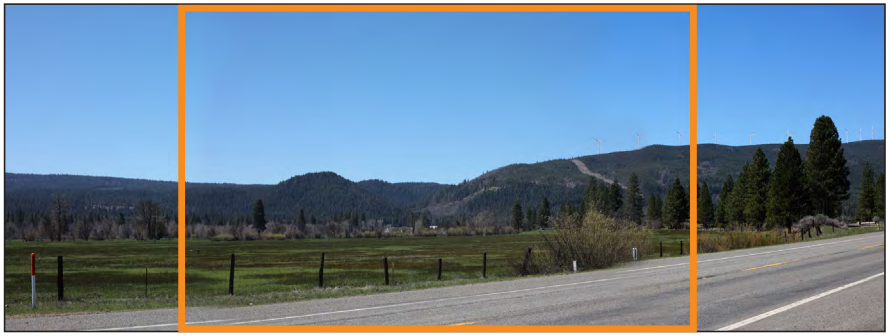
KOP 4 is located along SR 299 east of the Project Site and is representative of views east of Hatchet Ridge and west of Burney. Viewers would include moderately high to highly sensitive tourists and commuters and workers who would be less sensitive to visual change. As shown in **Figure 3.2-10**, *KOP 4, SR 299 at Tamarack Road*, Views from KOP 4 would be relatively long due to the extended, straight stretch of SR 299 in the open valley. Views from KOP 4 are not considered a scenic vista because there is no designated signage or place intended for the public to experience a scenic vista. Therefore, the following analysis focuses primarily on the potential for the Project to degrade the character or visual quality of views from KOP 4 as a publicly accessible vantage point.

The existing visual character of views from KOP 4 is defined by a defined, forested ridgeline in the background and broad open meadow in the foreground and middleground. Partially screened rural development and mature trees are visible in the middleground. Linear features such as the road and fence lines are visible in the foreground. A linear, cleared transmission right-of-way (ROW) extends from the right side of the valley, up the hillside toward the middle of the ridgeline. Atop the ridgeline, the towers, nacelles, and blades of the existing Hatchet Ridge turbines are visible. The existing visual quality of views from KOP 4 is moderate. Under existing conditions, views from KOP 4 have a moderately high level of natural harmony due to the densely vegetated hillsides which lead to the valley floor. The various man-made features visible from KOP do not have a coherent pattern. Therefore, views from KOP 4 have a low level of cultural order. The man-made components of views from KOP 4 detract from the overall coherence and landscape composition and vividness.

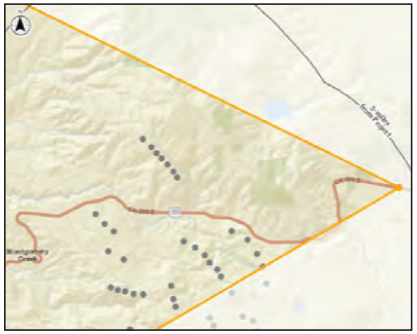
Two Project turbines would be partially visible in views, with just the turbine blades extending above the mountain ridgeline in the center of the view. These turbines would not be prominently visible to viewers at KOP 4 due to their low profile, although the motion of the blades above the ridgeline, could attract viewers' attention. Turbines of the Hatchet Ridge Wind Project would remain the most visible human-made feature in views from KOP 4. The visual character of views from KOP 4 would not change substantially. The additional turbine blades would be imperceptible to most viewers and would not substantially change the form, line, or color visible in existing views. The new turbines would not detract from the natural elements in daytime views and would not

A: View to the west-southwest from SR 299 at Tamarack Road, near Sierra Pacific Industries. Existing Hatchet Ridge turbines are visible less than 3 miles away.

B: View from KOP 4 with Project simulated. Two Project turbines would be visible between 4 and 6 miles away in the center of the view.



C: Existing view from KOP 4 (outlined) within broader context.



D: Approximate location of turbines within the 40-degree horizontal field of vision represented in the above view.

Specifications
Location: 40°52'27.26"N, 121°42'19.29"W
View Direction: West-Southwest
Date & Time: 18 April 2019, 12:07 p.m.
Camera Focal Length: 50 mm
Camera Make / Model: 5DsR
Photo Source: Stantec
Number of Proposed Turbines: 2

SOURCE: Stantec

Fountain Wind

Figure 3.2-10
KOP 4: SR 299 at Tamarack Road

reduce the cultural order, coherence, or landscape composition and vividness of views. At night, turbine lighting would be partially visible from KOP 4; however, it would be consistent with the lighting for the existing turbines on Hatchet Ridge. Therefore, due to the low profile of turbines and the presence of the existing turbines on Hatchet Ridge, the Project would not substantially reduce the visual quality of views from KOP 4. In summary, at KOP 4, the Project would have no impact on scenic vistas and would not substantially reduce the visual character or quality of views.

KOP 5: Burney

KOP 5 is located in downtown Burney, the main population center east of the Project Site. Viewers from this KOP would include local residents who would have sustained views of the Project, tourists traveling to or through Burney who would have brief views of the Project. Commuters and workers also could have static or brief views of the Project depending on whether they are moving through the town or stopped in Burney for an extended period of time. Views from KOP 5 are not considered to be a scenic because they reflect views from the community generally and because they would be blocked in substantial respect by built features. While sustained views of the Project may be possible from downtown, there is no designated signage or place intended for the public to experience a scenic vista. Therefore, the following analysis focuses primarily on the potential for the Project to degrade the character or visual quality of views from KOP 5 as a publicly accessible vantage point.

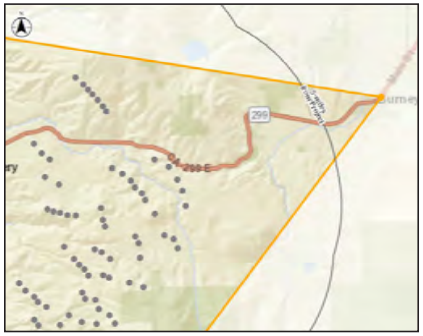
Existing visual character of views from KOP 5 is defined by features typical of suburban development including roads, structures, light poles, traffic lights, parking lots, and mature trees. The form of an extended forested ridgeline is visible in the background, which is interrupted by the structures and trees in the downtown area. A linear transmission line ROW is prominent on the ridgeline and the Hatchet Ridge turbines are visible atop the right side of the ridgeline, Existing visual quality of views from KOP 5 is moderate. Due to the contrast between the man-made features of the downtown area and the surrounding valley and ridgeline, natural harmony is considered moderately low. Similarly, none of the observable components of the view are particularly memorable, resulting a moderately low level of landscape composition and vividness. The cultural order and overall coherence of views are considered moderate.

As demonstrated in **Figure 3.2-11**, *KOP 5, Burney*, the Project would introduce turbines to the left of the existing Hatchet Ridge turbines and to the left of the transmission line corridor. Many of the Project turbines would be obscured by vegetation and intervening topography resulting in just their blades being visible above the ridgeline. The motion of the blades would be visible above the ridgeline. The additional turbines would not have an appreciable effect on the visual character of views from KOP 5. The turbines would add forms and colors similar to the existing turbines and would not substantially alter the existing visual character. From KOP 5, Project turbines would be seen as an extension of the existing Hatchet Ridge turbines. They would not appear as unique features and would result in a retained coherence and composition in views. Despite the increased size of the Project turbines compared to the existing turbines, the distance at which the Project turbines would be seen would result in the turbines appearing with a consistent height. Viewers in Burney would have intermittent views of the Project from the downtown area. At night, the existing lighting on the Hatchet Ridge turbines would appear extended along the ridgeline. Due to the

A: View to the west-southwest from downtown Burney. The existing Hatchet Ridge project is visible in the right portion of the view.

B: View from KOP 5 with Project simulated. Project turbines would be visible near the center of the view, to the left of existing Hatchet Ridge turbines, between 7 and 10 miles away.

C: Existing view from KOP 5 (outlined) within broader context.



D: Approximate location of turbines within the 40-degree horizontal field of vision represented in the above view.

Specifications
Location: 40°53'4.21"N, 121°39'27.93"W
View Direction: West-Southwest
Date & Time: 18 April 2019, 11:08 a.m.
Camera Focal Length: 50 mm
Camera Make / Model: 5DsR
Photo Source: Stantec
Number of Proposed Turbines: 8

SOURCE: Stantec

Fountain Wind

Figure 3.2-11
KOP 5: Burney

presence of the existing Hatchet Ridge Wind Project turbines and the combination of natural and manmade features visible from KOP 5, the Project would not reduce visual quality of views from KOP 5. In summary, the Project would not impact scenic vistas or reduce visual character or quality from KOP 5.

KOP 6: SR 299 at Pit River Overlook

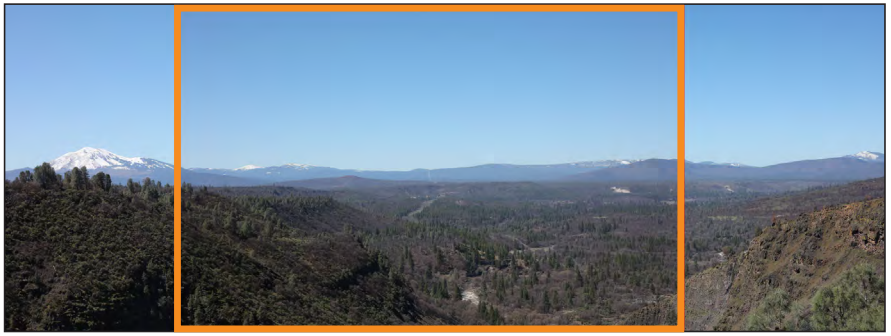
KOP 6 is located along SR 299 at the Pit River Overlook. This KOP also is representative of views along SR 299 east of SR 89, which is a regional arterial. The Pit River Overlook provides an informal opportunity for travelers along SR 299 to stop and contemplate views of the Pit River, varied topography in the valley, and peaks in the distance. Typical viewers at this location would include recreationists and tourists, although commuters also may travel the route. Most viewers are expected to experience this view while in motion and have relatively brief views of the KOP; however, viewers who stop at the informal pullout could experience sustained landscape views. This KOP location also is used as a reference point to conceptualize views of the Project Site from Lassen Peak or Burney Peak as they would both have expansive but distant views toward the Project Site looking northwest. Lassen Peak is located further from the Project Site than KOP 6, so the turbines would likely be less visible and have less of an impact than from KOP 6. Burney Peak is located closer to the Project Site than KOP 6 is. Therefore, in views of the Project Site from Burney Peak, turbines would likely be closer and more prominent along the ridgeline due to the distance from the Project Site.

The existing visual character of views from KOP 6 are defined by the varied forms of the topography and the various shades of greens and browns which form the layers of topography and ridgelines. The Pit River creates a linear feature that winds through the landscape. The presence of the transmission line ROW bisects views from KOP 6 and Hatchet Ridge Wind Project turbines are visible along the right side of the ridgeline when atmospheric haze or clouds do not limit visibility. As shown in **Figure 3.2-12a**, *KOP 6, SR 299-Pit River Overlook*, visual quality of views from KOP 6 is high. The views of the mountains and river valley provide a high degree of natural harmony, overall coherence, and landscape composition and vividness.

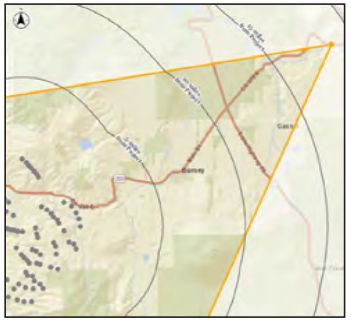
As shown in **Figure 3.2-12b**, KOP 6a, *KOP 6, SR 299-Pit River Overlook (Simulation)*, Project turbines visible to the left of the existing turbines would extend slightly the portion of the skyline that currently is occupied by wind turbines. The additional turbines would add colors and forms along the skyline which are similar to existing views. Additionally, the proposed turbines would not block or diminish the existing skyline or other prominent forms in the view. Therefore, the visual character of views from KOP 6 would not be substantially reduced by the Project. The additional Project turbines would reinforce the cultural order in existing views and would not substantially reduce the natural harmony, overall coherence, or landscape composition and vividness. At night, turbine lighting would be visible to viewers alongside the lighting of the Hatchet Ridge turbines. The Project would not reduce the visual quality of views from KOP 6. Additionally, in existing views, the visual focus for viewers at KOP 6 is the Pit River and the distant snowy skyline, and the existing turbines are visible but are not prominent within views.

A: View to the southwest from SR 299, at an overlook en route to Fall River Mills. Hatchet Ridge turbines are detectable along the ridgeline in the right side of the view.

B: View from KOP 6 with Project simulated. The Project would be visible just under 19 miles away.



C: Existing view from KOP 6 (outlined) within broader context.



D: Approximate location of turbines within the 40-degree horizontal field of vision represented in the above view.

Specifications
Location: 40°59'33.61"N, 121°29'2.01"W
View Direction: Southwest
Date & Time: 18 April 2019, 11:42 a.m.
Camera Focal Length: 50 mm
Camera Make / Model: 5DsR
Photo Source: Stantec
Number of Proposed Turbines: 36

SOURCE: Stantec

Fountain Wind

Figure 3.2-12a
KOP 6: SR 299-Pit River Overlook

ESA

E: Enlarged image showing view from KOP 6 with Project simulated.

SOURCE: Stantec

Fountain Wind

Figure 3.2-12b
KOP 6: SR 299-Pit River Overlook (Simulation)

KOP 7: Redding

KOP 7 is located on SR 299 near I-5 and is used as reference point to evaluate views from Redding and the general Sacramento Valley area. Viewers of this KOP would include residents and tourists with a moderately to high sensitivity to visual change and commuters and workers with more moderate sensitivities. The straight segment of highway would allow for sustained views for drivers along SR 299. Views from this KOP are also representative of views from eastern Redding where more static views would be available. No designated pullouts or signs are available for viewers at this KOP that would indicate a scenic vista; therefore, the following analysis focuses on the potential for the Project to degrade the character or visual quality of views from KOP 7 as a publicly accessible vantage point.

The existing visual character of views from KOP 7 is defined by the extensive Sacramento Valley and the defined uniform line and form of the mountain skyline east of Redding. The skyline is mostly uninterrupted and extensive panoramic views of the surrounding mountains are available. Built features such as roads, signage and the development associated with Redding are visible in the foreground and middleground. The existing visual quality of the view from KOP 7 is moderately high. As shown in **Figure 3.2-13a**, *KOP 7, Redding*, snowcapped peaks and forested ridgelines are visible in the background, built features such as the highway and nearby homes are visible in the foreground and middleground. The Hatchet Ridge Wind Project turbines are barely detectable on the left side of the view along the ridgeline when atmospheric conditions do not limit visibility.

As shown in **Figure 3.2-13b**, *KOP 7, Redding (Simulation)*, the Project's proposed turbines would be visible between the existing turbines and in the center of views. They would appear scattered with no orderly layout or pattern and would be larger when compared to the existing turbines. This would diminish the uniform line, color, and form of the ridgeline. The proposed turbines would encroach upon the skyline and could give the impression of development spilling down from the ridgeline resulting in an adverse impact to the visual character of views from the KOP. Due to the distance of the Project Site from KOP 7, the turbines would be barely visible in the distant background. However, the layout of the proposed turbines around the existing turbines would create an impression that an extended portion of the mountains is dedicated toward the development of wind energy. Nighttime lighting would be visible from this KOP and would increase the extent of turbine safety lighting on the hillside. Due to the scattered appearance of the turbines, the Project would reduce the level of cultural order, overall coherence, and landscape composition and vividness of views. The Project would reduce overall visual quality from moderately high to moderate.

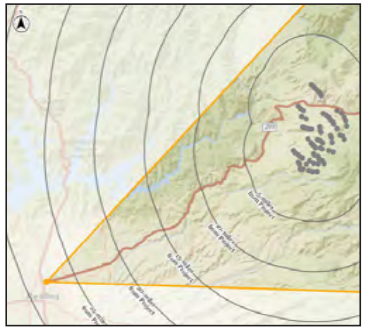
Impact Summary

As described in the KOP-specific analysis above, the Project's potential impact to visual resources would vary depending on existing visual elements in views from KOPs, the visibility of the Project, duration of views, and the visual sensitivity of viewers. Generally, the Project would result in long-term visual impacts due to the introduction of vertical elements and motion (when the rotor blades are in motion). In locations where no existing turbines are visible and where there are no other existing manmade features (such as power lines), the Project turbines would be a source of significant visual contrast. The amount of visual contrast created by the turbines would depend on the view from each KOP.

A: View to the east from eastbound SR 299, east of Redding near Shasta College and a local bike path. Existing Hatchet Ridge turbines are barely detectable along the ridgeline in the left side of the view.

B: View from KOP 7 with Project simulated. Project turbines would be visible just under 28 miles away.

C: Existing view from KOP 7 (outlined) within broader context.



D: Approximate location of turbines within the 40-degree horizontal field of vision represented in the above view.

Specifications
Location: 40°36'48.54"N, 122°21'20.27"W
View Direction: East-Northeast
Date & Time: 18 April 2019, 1:26 p.m.
Camera Focal Length: 50 mm
Camera Make / Model: 5DsR
Photo Source: Stantec
Number of Proposed Turbines: 72

SOURCE: Stantec

Fountain Wind

Figure 3.2-13a
KOP 7: Redding

E: Enlarged image showing view from KOP 7 with Project simulated.

SOURCE: Stantec

Fountain Wind

Figure 3.2-13b
KOP 7: Redding (Simulation)

Mountain Communities

Within the Mountain Communities Landscape Unit, the Hatchet Ridge Wind Project turbines are intermittently visible from various locations due to intervening topography and dense forests along SR 299. From certain KOPs such as KOP 2 and 3, that project's turbines are not visible and the existing ridgelines are uninterrupted. For this Project, turbine towers, hubs, and blades would be visible. Due to existing man-made infrastructure, the lack of designated scenic vistas, moderate existing visual quality, and the brief duration of most views, the Project turbines would not result in a substantial impact to scenic vistas, visual character, or visual quality.

From locations such as KOP 4 and KOP 5, the Hatchet Ridge Wind Project turbines are prominent in existing views: the towers, hubs, and blades of multiple turbines are visible in existing views and are prominent along the ridgelines. With the Project, views from KOP 4 of the Project's turbines would be mostly obscured - just the blade tips of most turbines would be visible. From KOP 5, the proposed turbine towers, hubs, and blades would be visible. From both of these locations, the turbines would extend slightly the line of existing turbines and would not impact scenic vistas, visual character, or visual quality.

In contrast to the other locations, the Hatchet Ridge Wind Project turbines are not visible from some locations to the west such as KOP 1, and there is no other element of development or man-made structures that reduces visual character or quality. The existing visual quality of views from this KOP is moderately high and views would be sustained from the designated overlook. With the Project, two turbines would dominate views and turbine towers, hubs, and blades would be visible. At this KOP, the presence of the turbines would dominate views at the scenic vista and create a substantial amount of visual contrast resulting in an adverse impact to the scenic vista and would substantially degrade visual character and quality.

Hat Creek and Pit River

Within the Hat Creek and Pit River Landscape Unit, the existing Hatchet Ridge Wind Project turbines would be visible in the distance in views to the west from some elevated locations. From KOP 6, the existing turbines are visible from a scenic vista along SR 299, but while multiple entire turbine towers are visible, the turbines are not prominent along the ridgeline and do not dominate existing views from the scenic vista. The Project would introduce additional turbines along the ridgeline; however, the new turbines would blend in with the existing turbines, extending the existing line of turbines slightly and in an organized pattern. The Project's proposed turbines would not be prominent along the ridgeline, and would not contrast with existing conditions. Therefore, from this location, the Project would not result in a substantial impact to a scenic vista, visual character, or visual quality. KOP 6 also is used as a reference point to consider other publicly accessible views of the Project Site from mid-distance to distant locations such as Burney Mountain or Lassen Peak. This view is representative of the visual change that would occur south and east of the Project Site at other publicly accessible locations. From locations such as Lassen Peak, the turbines would appear more distant and less visible than depicted in Figure 3.2-12b. However, some locations, such as Burney Peak, are located closer to the turbines than KOP 6. Therefore, the turbines would likely appear larger and feature more prominently in views than depicted in Figure 3.2-12b.

Sacramento Valley

Within the Sacramento Valley landscape unit, the existing Hatchet Ridge Wind Project turbines are faintly visible atop the distant ridgeline. Visual quality is moderately high due to the extended form and line of the mountain skyline east of Redding and the high degree of natural harmony, cultural order, overall coherence, and landscape vividness and composition. The Project would result in a longer extension of the line of turbines along the ridgeline left to right. Additionally, the Project's proposed turbines would appear larger than the turbines on Hatchet Ridge and would descend down the mountains, creating an appearance of development and wind energy encroaching upon the mountains east of Redding and occupying a large portion of the mountain skyline. This would reduce the quality of scenic vistas represented by KOP 7 and would reduce the visual character and quality of views from KOP 7 and the views for which it is representative, including views from the Valley and views from southeastern slopes north or the Project. Due to the distance between viewers at this KOP and the turbines, the proposed turbines would be barely visible along the ridgeline. Therefore, while the proposed turbines would extend the visibility of wind development along the hillside and would reduce visual quality, the turbines would not dominate views from the KOP and would not result in a moderate reduction of existing visual character or quality. As shown in Figure 3.2-6, the entire extent of the Project would be visible from many locations in the Valley, on SR 299 traveling east, and from southeastern facing slopes located northwest of the Project.

The change in visual quality that would result from the Project is summarized in **Table 3.2-2**, *Summary of Visual Quality Findings*, below.

TABLE 3.2-2
SUMMARY OF VISUAL QUALITY FINDINGS

KOP Location	Overall Visual Quality
Mountain Communities	
KOP 1 - Fountain Fire Overlook	Moderately High
With Project	Moderately Low
KOP 2 - Montgomery Creek	Moderate
With Project	Moderately Low
KOP 3 - Round Mountain	Moderate
With Project	Moderately Low
KOP 4 - SR 299 at Tamarack Road	Moderate
With Project	Moderate
KOP 5 – Burney	Moderate
With Project	Moderate
Hat Creek and Pit River	
KOP 6 - SR 299 Pit River Overlook	High
With Project	High
Sacramento Valley	
KOP 7 – Redding	Moderately High
With Project	Moderate

SOURCE: Appendix A, *Aesthetics*

As shown in Table 3.2-2 the Project would not reduce visual quality at a number of representative KOPs. However, the Project would result in a substantial reduction to visual character, visual quality, and the quality of scenic vistas at KOP 1. Viewers at KOP 1 are expected to have a moderately high to high sensitivity to visual change and would have sustained views of the KOP at the designated scenic vista. Therefore, due to the significant change in visual character, visual quality, and the quality of scenic vistas at KOP 1, Project operation would have a significant impact under this criterion. With the implementation of **Mitigation Measure 3.2-1** (Project Design to Reduce Aesthetic Impacts at KOP 1), turbines would be sited in order to consider surrounding topography and avoid the visibility of turbines from sensitive scenic vistas at KOP 1. Through the implementation of Mitigation Measure 3.2-1, the two turbines visible at KOP 1 (D02 and D03) would be relocated so that they are removed from views from KOP 1 or relocated so that just the turbine blades are visible above the ridgeline, the turbines would no longer dominate views from the scenic vista and the adverse impact on the scenic vista would be reduced. Additionally, if the turbines were to be removed from views from KOP 1or relocated such that just the turbine blades were visible, then the turbines would no longer introduce dominant forms and colors along the ridgeline and would not reduce the natural harmony and overall coherence of the KOP as significantly. Therefore, with the implementation of Mitigation Measure 3.2-1, the dominance of the turbines in views from KOP 1 would be reduced and the impact of the Project to the scenic vista, visual character, and visual quality at KOP 1 would be reduced to a less-than-significant level.

As described throughout the KOP discussion above, the Project would introduce visual contrast but would not reduce visual quality significantly from locations where the Project would blend in and expand the existing visual impact of the Hatchet Ridge Project. From locations where wind turbines are not currently visible, however, the Project would introduce a greater level of visual change. In the case of KOP 1, this would result in a significant impact. If turbines were to be removed from views from KOP 1, then the visual impact of the Project at KOP 1 could be reduced to a less-than-significant level. However, given uncertainty about the feasibility of removing, or sufficiently moving, the turbines from views from KOP 1, impacts would remain significant and unavoidable even with the implementation of Mitigation Measure 3.2-1. Additionally, while the amount of visual change from most representative viewpoints is not considered significant, when considered as a whole, the Project would have a significant impact on the visual character and quality of views in the Project region. There is no feasible mitigation that could reduce the visual impact of the Project as a whole. Therefore, the impact of the Project on scenic vistas, visual character, and visual quality would be significant and unavoidable.

Mitigation Measure 3.2-1: Project Design to Reduce Aesthetic Impacts at KOP 1

When finalizing the design for the Project, the Applicant shall site turbines to avoid placing turbines within the viewshed of KOP 1, or to reduce the visibility of turbines from KOP 1. For example, if the turbines were to be moved further downslope they would be less visible from KOP 1. When submitting site plans to the County of Shasta to be approved, the Applicant shall demonstrate to the County that the impacts from KOP 1 have been avoided or reduced. The turbines shall be painted in accordance with manufacturer's and Federal Aviation Administration marking requirements. Commercial messages and symbols shall not be used on turbine structures. When the site plans are presented to the County for approval, the Applicant also shall present the type of turbine

selected to the County so that the County may ensure that no commercial messages are used on the turbines.

Significance after Mitigation: Impacts resulting from operation of the Project would remain significant and unavoidable with the implementation of Mitigation Measure 3.2-1.

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b) Whether the Project would substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway.

Impact 3.2-2: The Project could damage scenic resources within a state scenic highway. (*Less-than-Significant Impact*)

As described above, most construction and decommissioning activities would be screened from SR 299 and would not be visible from publicly accessible viewpoints. While traffic due to deliveries and other vehicle travel to and from the Project site would increase traffic and large delivery loads on SR 299, the increase would be temporary (lasting the approximately 18- to 24-month construction period) and would be an approximately 25 percent increase in traffic during peak delivery times when compared to the visual impact from existing traffic due to timber operations and other traffic along SR 299.

As described in Section 3.2.2.3, *Regulatory Setting*, the nearest designated state scenic highway to the Project Site is a 3.3-mile section of SR 151 located approximately 28 miles from the western edge of the Project Site. Eligible State Scenic Highways near the Project Site include SR 89 (approximately 11 miles away), SR 299 east of SR 89 (approximately 11 miles away), and SR 44 (approximately 17 miles away). Additionally, SR 299 and I-5 are considered a "corridors in which the natural environment is dominant." Impacts to these highways are discussed below.

The Project would not degrade any rock outcroppings, historic buildings, or trees along a designated scenic highway. As described in Section 3.2.2.2, *Environmental Setting*, the Project would be constructed on private timber lands, and so would not be constructed within a scenic resource that is integral to the character of a scenic highway. The Project may, however, be visible from certain portions of designated and eligible highways. As shown on Figure 3.2-5, the Project would be highly visible along SR 299. From more distant viewing locations along SR 299, the Project would be visible adjacent to the existing Hatchet Ridge turbines. As SR 299 passes through the Project Site, fewer turbines would be visible, but they would be more prominent and would appear larger due to their proximity. The Project would be partially visible from a portion of SR 89 in the Hat Creek Valley. The full extent of the Project also would be visible from the portion of I-5 that passes through Redding and from a short section of SR 151 located near I-5.

KOP 6 is located along SR 299 and is near the eligible section of SR 299 and the portion of SR 89 from which the Project would be visible (see Figure 3.2-5). KOP 7 is located near the intersection of I-5 and SR 299 and is representative of views available from SR 151. Therefore, in the following discussion, these viewpoints are used as reference points for views experienced by

motorists driving along scenic highways. Viewers along designated scenic highways are assumed to have a moderate to moderately high degree of visual sensitivity to visual changes.

As described under Impact 3.2-1, the Project would not reduce the visual quality of views from KOP 6 because it would not create contrast with existing visual conditions. The proposed turbines would blend in with existing Hatchet Ridge Wind Project turbines and would not detract from the scenic vista available from KOP 6. Visual quality of views from KOP 6 would remain high. As described under Impact 3.2-1, turbines would be visible in the distance along the ridgeline, near the existing Hatchet Ridge Wind Project turbines. The turbines would be visible in the distance above the view's natural elements and would not reduce the natural harmony of existing view. Additionally, the Project turbines would reinforce the cultural elements in existing views, reinforcing the cultural order and overall coherence of views. Therefore, the Project would not contrast with existing visual conditions and would blend in with and extend existing forms along the ridgeline. The Project would not damage any specific scenic resources visible from this KOP. As shown in Figure 3.2-5, smaller portions of the Project would be visible from SR 89 than as shown for KOP 6. Additionally, SR 89 is lined with mature trees that enclose views and significantly limit views to the west. Based on the location of SR 89, the Project would likely result in less visual contrast from SR 89 as compared to KOP 6. Therefore, the Project would have a less-than-significant impact on views from SR 299 east of SR 89 and SR 89.

KOP 7 is located near SR 299 and I-5 and is considered a reference point for views from the designated scenic highway. As described under Impact 3.2-1, in views from KOP 7, the Project would add additional turbines to the mountains visible in the background from views from the Sacramento Valley. The additional turbines would barely be visible along the ridgeline but would appear scattered and would increase the appearance of encroaching development in the foothills. As a result, the Project would reduce the cultural order and overall coherence of views from this location. Overall visual quality of views from this KOP would be reduced; however, the quality of views from this KOP would remain moderate and impacts would be less than significant. Therefore, the Project would not substantially damage scenic resources within a state scenic highway and impacts would be less than significant.

Mitigation: None required.

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c) Whether the Project would create a new source of substantial light or glare which would adversely affect daytime or nighttime views in the area

Impact 3.2-3: The Project could create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area. (*Less-than-Significant Impact*)

Potential impacts relating to shadow flicker are analyzed in Section 3.11, *Hazards and Hazardous Materials*, in the context of Impact 3.11-6. As described there, any shadow flicker that would be caused by the Project would not be substantial or adversely affect daytime views in the area. Shadow flicker does not occur at night.

As discussed in Section 2.4.5.5, *Construction Schedule and Workforce*, construction is expected to occur during daytime hours; nighttime construction is not anticipated. If unexpected nighttime construction or deliveries were to be required, Project construction and decommissioning could result in a temporary increase of traffic light along SR 299 due to vehicle travel to and from the Project Site. At peak am and pm hours, the Project is expected to increase traffic on SR 299 by approximately 25 percent. If nighttime construction is required, it is not likely to require the same number of vehicles and delivery. Therefore, the increase in light from traffic on SR 299 in the event of nighttime construction is likely to be less than a 25 percent increase compared to existing conditions. Therefore, impacts from increased light from traffic during construction would be less than significant. As described in Section 3.2.4.1, *Methodology*, the Project would be set back from SR 299 and would be screened by forested areas near SR 299. During construction, the construction laydown area would have security lighting. Additionally, in the event that nighttime construction is required, nighttime construction lighting may be required. Security lighting also would be installed and maintained through the operations phase at the O&M facility. Both security lighting and construction lighting would be separated from the road and would be screened by intervening forest. However, depending on the lighting configuration, lighting has the potential to project upward and illuminate construction equipment. Additionally, construction lighting could potentially be seen from elevated locations. However, due to the screening of intervening trees, construction lighting would not be visible from most publicly accessible locations. Impacts would be less than significant.

Wind project component surfaces typically are not reflective. For example, the proposed turbines would be painted an off-white with a matte finish in accordance with FAA requirements and the proposed overhead electrical collector system would be installed on wood poles, which do not cause glare. Up to four permanent, unguyed and freestanding METs also would be constructed on the Project Site at heights up to 394 feet tall. METs typically are manufactured with a galvanized finish that weathers to a dull, non-reflective patina and so would not result in a new source of glare resulting from introduction of these Project elements. A less-than-significant impact related to glare would result.

Regarding lighting, as described in Section 2.4.1, *Wind Turbine Generators*, Section 2.4.4.4, *Meteorological Equipment*, and Section 3.2.2.3, *Regulatory Setting*, safety lighting would be required pursuant to FAA standards and Advisory Circular 70/7460-1L to reduce potential hazards to aircraft from the proposed turbines and METs. Designated turbines (potentially including all turbines) and METs would have flashing red lights. Due to the height of the proposed turbines, it is expected that each turbine to be lit would require two lights, one on either side of the turbine nacelle, to mark it as a potential hazard to air navigation. The Applicant would submit an FAA-approved lighting plan to the County before turbine installation. The extent of safety lighting on turbines ultimately would be determined pursuant to FAA review.

Figure 3.2-1 and Figure 3.2-6, both of which depict the areas from which the turbine hubs would be visible, demonstrates where in the study area aircraft warning lights could be visible. The visibility of nighttime lighting and the impact of nighttime views would vary depending on the proximity of the KOP to the turbines, the extent of existing light pollution at the KOP, and the frequency of viewers during nighttime hours.

At KOP 1, which is representative of views near SR 299 and Moose Camp Road, as there is no designated camping or other area where nighttime use would be common, most users would be daytime viewers. Nighttime lighting would be highly visible from this location and would introduce such lighting where none currently exists. Vegetation would partially screen nighttime lighting in views from KOP 1; however, the proximity of viewers to turbines would increase the visual impact of nighttime lighting. Turbine lighting in views from KOP 1 would be highly visible and unavoidable in nighttime views from this location; however, due to the limited number of nighttime viewers at this location and viewing locations along this section of SR -299, the impact of lighting would not be substantial.

In views from KOP 2, which represents views from Montgomery Creek, there would be a limited number of nighttime viewers at publicly accessible locations such as the elementary school. Similarly, in views from KOP 3, which represents views from Round Mountain, limited nighttime viewers may view the Project from the nearby community center near the Project. The Project would result in nighttime lighting along the ridgelines in each of these KOPs where no lighting is currently present. Although other sources of nighttime lighting exist in the vicinity of these KOPs (such as surrounding development), the turbines would introduce a new form of nighttime lighting. The distance between viewers and the turbines would reduce the prominence of the nighttime lights. Additionally, few nighttime viewers would be expected at this location and views are expected to be brief as travelers move along SR 299.

From KOP 4, which is representative of views east of Hatchet Mountain and west of Burney, few nighttime viewers would be expected as it is not located within a community and there is no designated area for nighttime viewers to stop along SR 299. The lighting of a few Project turbines would barely be visible above the ridgeline. The lights of these few turbines would be located adjacent to the lights of the existing Hatchet Ridge turbines. Therefore, the nighttime lighting introduced by the Project would not create a significant new source of nighttime lighting.

From KOP 5, the number of nighttime viewers would be greater as Burney is the main population center east of the Project and tourists, recreationists, and residents could experience nighttime views from locations such as KOP 6. The safety lights on the Project turbines would be positioned at a similar height as the lights on the existing Hatchet Ridge Project and would appear in roughly an extended line from the existing lights along the Hatchet Ridge Project. The Project would extend nighttime lighting similar to the existing lights of the Hatchet Ridge Wind Project. However, it would not introduce a substantial new source of nighttime lighting that would create a substantial amount of contrast in nighttime views.

Viewers at KOP 6 would primarily visit the informal overlook during the daytime as it is an informal pullout along the highway that would not be likely to attract nighttime viewers. This KOP also is representative of views available while traveling along SR 299 east of SR 89, a regional arterial. These nighttime views could be experienced by communities east of the Project Site and travelers along SR 299. Additionally, the safety lights on the Project turbines would be at a similar height as the lights on the existing Hatchet Ridge Project and would appear in roughly an extended line from the existing lights along the Hatchet Ridge Project. Therefore, the nighttime lighting introduced by the Project would not create a substantial new source of nighttime lighting.

At KOP 7 the number of viewers would be higher due to nighttime traffic along SR 299. Project safety lighting would be visible alongside the safety lighting of the existing Hatchet Ridge turbines. Due to the scattered order of turbines at this location, the nighttime safety lighting would not appear in a line and would appear more scattered. While the safety lights associated with Hatchet Ridge are clustered along the ridgeline and distant, the Project would extend the nighttime lighting associated with the Project horizontally and vertically along the ridgeline.

From KOP locations 4 through 7, the additional nighttime lighting of the Project turbines would extend the nighttime lighting of the existing Hatchet Ridge Wind Project. If alternating blinking lighting between the Hatchet Ridge turbines and the proposed turbines were to occur the visual impact of the nighttime lighting would increase. However, at these locations, the Project would not introduce a significant new source of nighttime lighting that would contrast with existing nighttime lighting conditions. In views from KOP 1, 2, and 3, the Project turbines would introduce nighttime lighting where nighttime light pollution is currently limited to light associated with rural development. Viewer exposure to nighttime lighting at KOP 1 and along SR 299 west near Moose Camp road would be very limited and; therefore, the nighttime lighting introduced by the Project would not have a substantial impact on nighttime views. Viewer exposure within communities west of the Project Site would be slightly greater due to nearby community resources such as community centers and clinics. some of these locations would be low due to the limited number of viewers during nighttime hours. However, in these views, due to existing sources of lighting, the space between the viewer and the turbines, and the few turbines visible from each of the KOPs, the additional source of nighttime lighting would not have a substantial impact on nighttime views. Therefore, impacts under this criterion would be less than significant.

Mitigation: None required.

3.2.4.3 PG&E Interconnection Infrastructure

As described in Section 3.2.2.2, *Environmental Setting*, the Project Substation, Switching Station and associated PG&E interconnection facilities would be located within the Project Site, away from publicly accessible viewpoints. No mitigation would be required specific to the PG&E interconnection infrastructure. As part of the Project, construction, operation, maintenance and decommissioning of the PG&E interconnection infrastructure would result in a less-than-significant impact relating to the potential for a substantial adverse effect on a scenic vista, a substantial degradation of the character or visual quality of views from publicly accessible vantage points (i.e., any of the KOPs), or to substantially damage scenic resources within a state scenic highway. Similarly, because the four to six new transmission support structures and other infrastructure would not include substantial new sources of light or glare, the Project-proposed construction and modifications of PG&E infrastructure would have a less-than-significant impact.

3.2.4.4 Direct and Indirect Effects of Alternatives

Alternative 1: South of SR 299

Under Alternative 1, the up to seven turbines north of SR 299 would not be constructed, resulting in incrementally fewer obstructions in the visual landscape and incrementally fewer safety lights. Depending on the specific viewing location or KOP, this alternative could reduce aesthetic impacts. However, from certain locations, clustering of turbines south of SR 299 could reduce the coherence between the Hatchet Ridge Project and the proposed Project, creating an appearance of multiple separate wind energy generation projects encroaching in the foothills. Any increase or decrease in the aesthetic impacts created by Alternative 1 would not be significant. Therefore, depending on the viewing location or KOP, Alternative 1 could either slightly increase or reduce aesthetic impacts. Impacts would remain less than significant relating to scenic vistas, publicly accessible vantage points (i.e., the KOPs), scenic resources within a state scenic highway, and new sources of light or glare.

Alternative 2: Increased Setbacks

Under Alternative 2, the setbacks required between turbines and residences and SR 299 would be increased. A setback of three times the turbine height would be required from residences and a setback of 1.5 times the turbine height would be required from SR 299 and from two private roads. The resulting spacing of the turbine strings could reduce from certain KOPs (e.g., KOPs 1, 2, and 3), the visibility and visual impact of turbines from SR 299 and regarding views from KOPs near SR 299. This alternative would slightly reduce the overall visual impact of the wind energy development compared to the Project. However, impacts to visual quality and character would remain significant and unavoidable.

No Project Alternative

If the No Project Alternative is implemented, none of the proposed wind turbines and associated transformers, associated infrastructure, or ancillary facilities would be constructed, operated and maintained, or decommissioned on the Project Site, FAA-required safety lighting would not be installed. The proposed overhead and underground electrical collector system and communications lines would not be developed; and the onsite collector substation, switching station, and operation and maintenance facility would not be constructed. Laydown areas would not be cleared, no new access roads would be constructed, and no existing roads would be improved to achieve the widths needed to accommodate the delivery of turbine components. The Project Site would continue to be operated as managed forest timberlands. Because there would be no change relative to baseline conditions, the No Project Alternative would create no impact related to Aesthetics.

The Project Site is zoned for timber production. Pursuant to regulations implementing the California Timberland Productivity Act (Government Code §51100 et seq.; 14 Cal. Code Regs. §897[a]), there is a legal presumption that “timber harvesting is expected to and will occur on such lands.” The regulations further specify that timber harvesting on such lands “shall not be presumed to have a Significant Adverse Impact on the Environment” (14 Cal. Code Regs. §898). Therefore, the No Project Alternative, including anticipated timber harvesting, is not presumed to

result in a significant adverse individual or cumulative effect to aesthetics. CAL FIRE would review any future timber harvesting proposal to evaluate any potential project-specific, site-specific environmental impacts.

3.2.5 Cumulative Analysis

The geographic scope for cumulative effects is the 30-mile radius identified in Section 3.2.2.1, *Study Area*. That distance is about as far as the eye can distinguish features of the Project. Beyond that distance, a viewer would not easily be able to discern Project turbines in combination with another project or feature. The Project would have visual impacts during all phases of construction (short-term and temporary impacts during construction and decommissioning and long-term impacts during operation); therefore, the temporal scope for cumulative impacts spans from Project construction through decommissioning.

3.2.5.1 Scenic vistas and the Character or Visual Quality of Views from Publicly Accessible Vantage Points or from State Scenic Highways

As described above, the Project would have a potentially significant impact on views from scenic vistas and publicly accessible views unless recommended mitigation measures are implemented, and a significant unavoidable impact on the scenic vista, visual character and visual quality of views from KOP 1. If implemented, it is possible that Mitigation Measure 3.2-1 would reduce this impact to a less-than-significant level; however, given uncertainty in light of the measure's feasibility, the Project's incremental contribution to cumulative effects would be significant and unavoidable. While the Project would not create a substantial amount of contrast with the existing visual character or quality from most locations, taken together, the overall visual impact of the Project would be significant due to the number of publicly accessible viewpoints that would have views of the Project and the impact to visual quality across the region.

Within the study area, cumulative projects that would cause impacts that could combine with the impacts of the Project include the Hatchet Ridge Wind Project, ongoing commercial timber operations in the area, forest thinning Projects, the ongoing effects of climate change as it pertains to drought and wildfire, existing and proposed power lines and electrical infrastructure, active and reclaimed mining sites, and commercial development (see Section 3.1.2.1, *Cumulative Scenario*). These types of projects could combine with the impacts of the Project when viewed together in the same view or when viewed in succession along a travel route. Timber operations in the area have an ongoing adverse impact on visual character and quality by increasing the presence of clear cut areas, logging trucks, and equipment along SR 299, thereby reducing the natural harmony of views in the area. The Hatchet Ridge Wind Project has an ongoing, significant adverse effect on visual character and quality in the region by creating contrast between the natural environment and man-made features or interruptions to the landscape. The Hatchet Ridge Project, ongoing logging operations, and other cumulative projects combine to create a significant and adverse cumulative impact to aesthetic resources.

In views from certain KOP locations such as KOPs 4-7, the Project would be visible in the same view as the Hatchet Ridge Wind Project. From most of these viewing locations, the Project would be visible as an extension of the Hatchet Ridge Project (KOPs 4, 5, and 6), from other locations, the Project would appear scattered from Hatchet Ridge Wind Project components, creating an impression of increasing encroaching development in the foothills (KOP 7). In other viewing locations, such as from KOP 1, 2, and 3, the Project would not be visible alongside Hatchet Ridge Wind Project turbines, but would be viewed cumulatively as a viewer drives along SR 299. Therefore, the Project would contribute to the existing significant adverse cumulative impact to aesthetic resources as the Project would increase the amount of man-made development and contrast with the natural environment as viewed from certain locations and seen in succession driving along SR 299.

From most viewing locations where both Hatchet Ridge and the proposed Project would be visible, the Project would appear as an extension of Hatchet Ridge. The Project would result in a noticeable increase in the number of turbines visible from some locations resulting in an increase in the amount of contrast in views. In some views (as in from KOP 7), the Project would appear scattered and distinct from Hatchet Ridge, and would significantly increase the amount of contrast with the natural environment. Therefore, from vantage points where the Project turbines would be visible adjacent to existing turbines, the Project's contribution to the existing significant cumulative impact would be cumulatively considerable.

When viewed in succession, as when viewed driving along SR 299, the Project would intermittently be visible alone and in combination with the Hatchet Ridge Project. Under existing conditions, certain portions of SR 299 have no views of turbines and retain the visual quality of a route along which the natural environment is dominant. The proposed Project would increase the encroachment of development along this route and reduce the natural harmony of views along SR 299. The Project would extend the presence of wind development as visible from the Sacramento Valley, through the Project Site and in Hat Creek Valley. Due to increase in the number of turbines visible, the scattered nature of the turbines, and the scale of the turbines, as one drives along SR 299, the Project would result in an increasing dominance of wind turbines within the region. Therefore, the Project would cause a considerable contribution to an existing significant adverse cumulative impact. No reasonable, feasible mitigation measures are available to reduce the Project's incremental contribution to a level that it would not be cumulatively considerable.

3.2.5.2 Scenic Resources within a State Scenic Highway

As described above, the Project would have a less-than-significant impact to scenic resources within a state scenic highway. Projects included in the cumulative scenario which could have an impact on scenic resources within a state scenic highway include ongoing logging and timber operations and the Hatchet Ridge Wind Project. Views toward the Project area from the portion of SR 151 that is near I-5 and SR 89 represent long distance views where the Hatchet Ridge turbines and existing logging is not highly visible in views toward the Project Site. As described in the analysis above, mature trees line SR 89 and significantly enclose views. The Project would be only visible from only a few locations where there are open views to the west. In these instances, the turbines would appear very small along the ridgeline and would not significantly

increase visual contrast. Along SR 151, near the intersection with SR 299, the Hatchet Ridge Wind Project turbines are barely visible along the distant ridgeline. The proposed Project would elongate the extent of turbines slightly, but this change would be barely perceptible due to the distance between SR 151 and the Project site and intermittent buildings. Therefore, the Project would not result in an impact to visual quality from SR 151 that could be cumulatively considerable.

From SR 299, Hatchet Ridge Wind Project turbines are intermittently visible as one drives along SR 299, and dominant in certain views from SR 299 leading to a significant cumulative condition with regard to impacts to views from SR 299. As described above, the Project would increase the number of turbines visible from a given location, blending in with the existing Hatchet Ridge Wind Project turbines. In other views, the Project would be visible separately from the other project. For the reasons described above, the Project would not have a cumulatively considerable contribution to views available from SR 299; therefore, the Project would not have a cumulatively considerable impact to views from scenic highways.

3.2.5.3 Sources of Substantial Light or Glare

Within the study area, cumulative projects that could combine with the glare or lighting impacts of the Project including the Hatchet Ridge Wind Project, increased traffic along highways, and increased rural and commercial development. Due to the Hatchet Ridge Wind Project, there is an existing significant and adverse cumulative impact to the nighttime lighting environment. As described above, from certain locations, the lighting from the proposed turbines would be viewed as an extension of the lighting from the existing project. From certain locations, the number of turbines visible would double, resulting in a doubling of the lights visible across ridgelines. While the impact of the Project on existing conditions at these viewing locations would not be considered significant, the extension of turbine lighting across ridgelines would result in a cumulatively considerable contribution to an existing adverse cumulative condition. No reasonable, feasible mitigation measures are available to reduce the Project's incremental contribution to a level that it would not be cumulatively considerable.

From other locations, Project lighting would be visible cumulatively, as one drives along SR 299, decreasing the area along SR 299 where no turbine lighting is visible. As shown in views from KOP 1, 2, and 3 few turbines would be visible from SR 299. This would result in additional locations along SR 299 where a few safety lights would be visible. The Project would result in an extension of areas along SR 299 where turbine lighting is visible, resulting in turbine lighting in areas with very limited nighttime lighting. Therefore, the Project would have cumulative considerable contribution to an adverse cumulative condition. No reasonable, feasible mitigation measures are available to reduce the Project's incremental contribution to a level that it would not be cumulatively considerable.

3.2.6 References

California Department of Transportation (Caltrans), 2019. List of eligible and officially designated State Scenic Highways, August, 2019. Available online: https://dot.ca.gov/programs/design/lap-landscape-architectureand- community-livability/lap-liv-i-scenic-highways. Accessed February 20, 2020.

Federal Aviation Administration (FAA), 2018. Advisory Circular: Obstruction Marking and Lighting. AC No. 70/7460-1L, Change 2. August 17, 2018.

Federal Highway Administration (FHWA), 2015. Guidelines for the Visual Impact Assessment of Highway Projects. (FHWA-HEP-15-029.) January 2015.

Shasta County, 2004. Shasta County General Plan as Amended Through September 2004. September. Available online: https://www.co.shasta.ca.us/index/drm_index/planning_index/plng_general_plan.aspx. Accessed February 20, 2020.

3.3 Air Quality

This section identifies and evaluates issues related to Air Quality in the context of the Project and alternatives. It includes information about the physical and regulatory setting and identifies the criteria used to evaluate the significance of potential impacts, the methods used in evaluating these impacts, and the results of the impact assessment. The information and analysis presented are based in part on emissions calculations presented in **Appendix B**, *Air Quality and Greenhouse Gas Emissions.*

The Shasta County Air Quality Management District (AQMD), consistent with its role as a Responsible Agency, provided initial input for the County's environmental review process shortly after the CUP application was filed for the Project (AQMD, 2018). Later, in response to the issuance of the notice of intention to prepare this Draft EIR, the County received scoping input from the AQMD and others raising concerns about the proximity of residential receptors to Project emissions from construction material delivery vehicles (including wide or "super" loads for turbine components) originating outside the County, secondary impacts resulting from increased emissions from other vehicle delays resulting from traffic controls and lane closures required for material deliveries, emissions from construction worker commute trips and construction vehicles, on-site vehicle and equipment emissions for site preparation-related timber harvesting, and dust. All scoping input received, including that regarding air quality, is provided in Section 4.1 of the Scoping Report, a copy of which is provided in **Appendix J**, *Scoping Report*.

3.3.1 Setting

3.3.1.1 Study Area

The Project Site is in Shasta County in the extreme northern end of the Sacramento Valley Air Basin (Air Basin), which is comprised of Butte, Colusa, Glenn, Sacramento, Shasta, Sutter, Tehama, and Yuba counties, the western portion of Placer County, and the eastern portion of Solano County. The geographic area of analysis for purposes of this section is the Air Basin and a small portion of San Joaquin Valley Air Basin (SJVAB). The vast majority of Project emissions would occur in Shasta County except for a portion of truck trips that would be required to deliver turbine components that would originate at the Port of Stockton, which is in the extreme northwestern end of SJVAB.

3.3.1.2 Environmental Setting

Geography and Climate

Air quality is affected by both the rate and location of pollutant emissions and by meteorological conditions, which influence movement and dispersal of pollutants. Atmospheric conditions such as wind speed, wind direction, and air temperature gradients, along with local topography, provide the link between air pollutant emissions and air quality.

The Air Basin is surrounded by the Klamath and Coastal Mountains to the northwest and the Cascade Mountains to the northeast and east. When winds are calm with fairly stable atmospheric conditions, the potential for substantial air pollution in the Air Basin is considered high (Shasta County, 2004).

The low elevation areas of Shasta County generally experience moderate to very poor capability to disperse pollutants nearly 80 percent of the time. This is primarily due to the relatively stable atmosphere that acts to suppress vertical air movement. Extremely stable atmospheric conditions referred to as "inversions" act as barriers to pollutants. Elevations within the Project Site range from 3,000 to 6,000 feet above sea level. In valley locations under 1,000 feet elevation, such as the Redding Metropolitan area approximately 30 miles to the southwest of the Project Site, create a "lid" under which pollutants become trapped. Dust and other pollutants can be trapped within these inversion layers and will not disperse until atmospheric conditions become more unstable. This situation creates concentrations of pollutants at or near the ground surface that can pose significant health risks for plants, animals, and people (Shasta County, 2004).

The climate in the vicinity of the Project Site provides average maximum and minimum winter (i.e., January) temperatures of 44 degrees Fahrenheit (ºF) and 19 ºF, respectively, while average summer (i.e., July) maximum and minimum temperatures are 88 ºF and 44 ºF, respectively (WRCC, 2020a). Rainfall averages approximately 67 inches per year and snowfall averages 79 inches per year, with an average winter snow depth of 2 inches (WRCC, 2020b). Average annual wind speeds in the vicinity of Round Mountain are approximately 19 miles per hour (mph), with average monthly peak wind speed at approximately 29 mph during October, and average monthly minimum average wind speed at 11 mph in June (USA, 2020). A scoping comment noted south-west prevailing summer winds. See Letter P117, provided in Appendix H of the Scoping Report included as Appendix J to this Draft EIR.

Criteria Air Pollutants

The U.S. Environmental Protection Agency (USEPA) has identified criteria air pollutants and has set National Ambient Air Quality Standards (NAAQS) for widespread pollutants from numerous and diverse sources that are a threat to public health and welfare. The USEPA has set NAAQS for the following seven principal pollutants, which are called “criteria” pollutants:

- Carbon monoxide (CO);
- Lead;
- Nitrogen dioxide (NO_2);
- Ozone;
- Particulate matter less than or equal to 10 microns in diameter (PM_{10});
- Particulate matter less than or equal to 2.5 microns in diameter ($PM_{2.5}$); and
- Sulfur dioxide (SO_2).

The State of California has established California Ambient Air Quality Standards (CAAQS) for these criteria pollutants, as well as ambient air quality standards for sulfates, hydrogen sulfide (H_2S), and vinyl chloride. NAAQS and CAAQS are summarized in Table 3.3-2, *NAAQS/CAAQS*

and Attainment Status for Shasta County. Criteria pollutants that would be generated by the Project are described below.

Ozone

Ozone is a respiratory irritant and an oxidant that increases susceptibility to respiratory infections and that can cause substantial damage to vegetation and other materials. Ozone is not emitted directly into the atmosphere, but is a secondary air pollutant produced in the atmosphere through a complex series of photochemical reactions involving reactive organic gases (ROG) and nitrogen oxides (NO_x). ROG and NO_x are known as precursor compounds for ozone. Significant ozone production generally requires ozone precursors to be present in a stable atmosphere with strong sunlight for approximately 3 hours.

Ozone is a regional air pollutant because it is not emitted directly by sources, but is formed downwind of sources of ROG and NO_x under the influence of wind and sunlight. Ozone concentrations tend to be higher in the late spring, summer, and fall, when conditions, such as long sunny days and regional subsidence inversions, are conducive to the formation and accumulation of secondary photochemical compounds.

According to the USEPA, ozone can cause the muscles in the airways to constrict potentially leading to wheezing and shortness of breath (USEPA, 2019). Ozone can make it more difficult to breathe deeply and vigorously; cause shortness of breath and pain when taking a deep breath; cause coughing and sore or scratchy throat; inflame and damage the airways; aggravate lung diseases such as asthma, emphysema and chronic bronchitis; increase the frequency of asthma attacks; make the lungs more susceptible to infection; continue to damage the lungs even when the symptoms have disappeared; and cause chronic obstructive pulmonary disease (USEPA, 2019). Long-term exposure to ozone is linked to aggravation of asthma, and is likely to be one of many causes of asthma development and long-term exposures to higher concentrations of ozone may also be linked to permanent lung damage, such as abnormal lung development in children (USEPA, 2019).

Inhalation of ozone causes inflammation and irritation of the tissues lining human airways, causing and worsening a variety of symptoms and exposure to ozone can reduce the volume of air that the lungs breathe in and cause shortness of breath (CARB, 2019a). People most at risk from breathing air containing ozone include people with asthma, children, older adults, and people who are active outdoors, especially outdoor workers (USEPA, 2019). Children are at greatest risk from exposure to ozone because their lungs are still developing and they are more likely to be active outdoors when ozone levels are high, which increases their exposure (USEPA, 2019). Studies show that children are no more or less likely to suffer harmful effects than adults; however, children and teens may be more susceptible to ozone and other pollutants because they spend nearly twice as much time outdoors and engaged in vigorous activities compared to adults (CARB, 2019a). Children breathe more rapidly than adults and inhale more pollution per pound of their body weight than adults and are less likely than adults to notice their own symptoms and avoid harmful exposures (CARB, 2019a).

Nitrogen Dioxide

Nitrogen dioxide (NO_2) is an air quality pollutant of concern because it acts as a respiratory irritant. NO_2 is a major component of the group of gaseous nitrogen compounds commonly referred to as oxides of nitrogen (NO_x). A precursor to ozone formation, NO_x is produced by fuel combustion in motor vehicles, industrial stationary sources (such as industrial activities), ships, aircraft, and rail transit. Typically, NO_x emitted from fuel combustion is in the form of nitric oxide (NO) and NO_2. NO is converted to NO_2 when it reacts with ozone or undergoes photochemical reactions in the atmosphere. NO_2 can potentially irritate airways in the human respiratory system (USEPA, 2016). Short-term exposures can aggravate respiratory diseases, particularly asthma, leading to respiratory symptoms (such as coughing, wheezing or difficulty breathing), hospital admissions and visits to emergency rooms and longer exposures to elevated concentrations of NO_2 may contribute to the development of asthma and potentially increase susceptibility to respiratory infections.

Carbon Monoxide

Carbon monoxide (CO) is a non-reactive pollutant that is a product of incomplete combustion and is mostly associated with motor vehicle traffic. High CO concentrations develop primarily during winter when periods of light winds combine with the formation of ground level temperature inversions (typically from the evening through early morning). These conditions result in reduced dispersion of vehicle emissions. Motor vehicles also exhibit increased CO emission rates at low air temperatures. When inhaled at high concentrations, CO combines with hemoglobin in the blood and reduces the oxygen-carrying capacity of the blood. This results in reduced oxygen reaching the brain, heart, and other body tissues. This condition is especially critical for people with cardiovascular diseases, chronic lung disease, or anemia.

Particulate Matter

Particulate matter less than 10 microns in diameter (PM_{10}) and particulate matter less than 2.5 microns in diameter ($PM_{2.5}$) represent fractions of particulate matter that can be inhaled into air passages and the lungs and can cause adverse health effects. Particulate matter in the atmosphere results from many kinds of dust- and fume-producing industrial and agricultural operations, fuel combustion, and atmospheric photochemical reactions. Some sources of particulate matter, such as demolition and construction activities, are more local in nature, while others, such as vehicular traffic, have a more regional effect. Particulates can damage materials and reduce visibility. Very small particles of certain substances (e.g., sulfates and nitrates) can cause lung damage directly, or can contain adsorbed gases (e.g., chlorides or ammonium) that may be injurious to health. According to a study by the California Air Resources Board (CARB), the estimated number of annual $PM_{2.5}$-related premature deaths in California is 9,200 (CARB, 2010). A large body of scientific evidence indicates that both long-term and short-term exposure to $PM_{2.5}$ can cause a wide range of health effects (e.g., aggravating asthma and bronchitis, causing visits to the hospital for respiratory and cardiovascular symptoms, and contributing to heart attacks and deaths) (CARB, 2020a).

Sulfur Dioxide

Sulfur dioxide (SO_2) is a colorless acid gas with a pungent odor. It has potential to damage materials and it can have health effects at high concentrations. It is produced by the combustion

of sulfur-containing fuels, such as oil, coal, and diesel. SO_2 can irritate lung tissue and increase the risk of acute and chronic respiratory disease.

Toxic Air Contaminants

Toxic air contaminants (TACs) are airborne substances that are capable of causing short-term (acute) and/or long-term (chronic or carcinogenic, i.e., cancer-causing) adverse human health effects (i.e., injury or illness). TACs include both organic and inorganic chemical substances. They may be emitted from a variety of common sources including gasoline stations, automobiles, dry cleaners, industrial operations, and painting operations. The current California list of TACs includes nearly 200 compounds, including Diesel Particulate Matter (DPM) emissions from diesel-fueled engines (CARB, 2011).

Existing Air Quality

The AQMD is the local air district responsible for air quality within Shasta County. The AQMD maintains a regional monitoring network that measures the ambient concentrations of criteria pollutants in the County. Ambient air quality measurements from air monitoring stations maintained by the AQMD help to determine the level of air quality in the local area. The closest air quality monitoring stations to the Project Site are the Shasta Lake monitoring station, located approximately 27 miles west-southwest of the southwestern Project Site boundary, and the Redding monitoring station, located approximately 30 miles southwest of the southern Project Site boundary. **Table 3.3-1** shows a 5-year (2014 through 2018) summary of ozone and PM_{10}, data collected at the Shasta Lake monitoring station, and $PM_{2.5}$ data collected at the Redding monitoring station. The data are compared to the CAAQS and NAAQS.

TABLE 3.3-1
AIR QUALITY DATA SUMMARY (2014–2018) FOR THE STUDY AREA

Pollutant	Standard	Monitoring Data by Year				
		2014	2015	2016	2017	2018
Ozone – Shasta Lake						
Highest 1 Hour Average (ppm)		0.067	0.091	0.093	0.096	0.111
Days over State Standard	0.09	0	0	0	1	1
Highest 8 Hour Average (ppm)		0.062	0.082	0.082	0.088	0.088
Days over National Standard*	0.070	0	12	13	13	11
Particulate Matter (PM_{10}) – Shasta Lake						
Highest 24 Hour Average (µg/m^3)		77	84	32	84	142
Measured Days over State Standard	50	1	1	0	1	8
State Annual Average (µg/m^3)	20	*	14	12	*	*
Particulate Matter ($PM_{2.5}$) - Redding						
Highest 24 Hour Average (µg/m^3)		22	65	13	67	131
Measured Days over National Standard	35	0	1	0	1	5
State Annual Average (µg/m^3)	12	5	*	*	8	*

NOTES: ppm = parts per million; µg/m^3 = micrograms per cubic meter; * = insufficient data.

SOURCE: CARB, 2020b

As shown in Table 3.3-1, measured ozone levels exceeded the State 1-hour ozone standard once per year during 2017 and 2018. The national 8-hour ozone standard was not exceeded in 2014, but exceeded between 11 and 13 times per year during the rest of the 5-year period. PM_{10} was measured to exceed the 24-hour State PM_{10} standard once per year during 2014, 2015, and 2017, but was measured to exceed the standard eight times in 2018. $PM_{2.5}$ was measured to exceed the national 24-hour $PM_{2.5}$ standard once per year in 2015 and 2017, and was measured to exceed the standard five times in 2018. The relatively high PM_{10} and $PM_{2.5}$ measurements in 2018 are likely attributed to the Camp Fire that occurred in Paradise, approximately 75 miles south-southeast of Shasta Lake. The Camp Fire impacted regional air quality in the late Fall of 2018, throughout northern and central California (Quartz, 2018).

Sensitive Receptors

Some receptors are considered more sensitive than others to air pollutants. The reasons for greater than average sensitivity include pre-existing health problems, proximity to emissions sources, or duration of exposure to air pollutants. Schools, hospitals, and convalescent homes are considered to be relatively sensitive to poor air quality because children, elderly people, and the infirm are more susceptible to respiratory distress and other air quality-related health problems than the general public. Residential areas are considered sensitive to poor air quality because people usually stay home for extended periods of time, with greater associated exposure to ambient air quality. Recreational uses are also considered sensitive due to the greater exposure to ambient air quality conditions because vigorous exercise associated with recreation places a high demand on the human respiratory system. The AQMD considers sensitive receptors to be facilities that house or attract children, the elderly, people with illnesses, or others who are especially sensitive to the effects of air pollutants (AQMD, 2003a).

The closest sensitive receptors to the Project Site are residences. The nearest residence to any of the work areas on the Project Site are off Sycamore Road, approximately 1,900 feet to a construction staging area. The closest residence to any of the access roads on the Project Site are along Moose Avenue, at a distance of approximately 400 feet.

3.3.1.3 Regulatory Setting

Air quality within the Air Basin is addressed through the efforts of various federal, State, and local government agencies. These agencies work jointly, as well as individually, to improve air quality through legislation, regulations, planning, policy-making, education, and a variety of programs. The air pollutants of concern and agencies primarily responsible for improving the air quality within the Air Basin and the pertinent regulations are discussed below.

Criteria Air Pollutants

Regulation of air pollution is achieved through both CAAQS and NAAQS as well as emission limits for individual sources of air pollutants. As required by the federal Clean Air Act (CAA), the USEPA has identified criteria pollutants and has established NAAQS to protect public health and welfare. NAAQS have been established for ozone, CO, NO_2, PM_{10}, $PM_{2.5}$, and lead. These pollutants are called “criteria” air pollutants because standards have been established for each of them to meet specific public health and welfare criteria.

To protect human health and the environment, the USEPA has set "primary" and "secondary" maximum ambient thresholds for all six criteria pollutants. Primary thresholds were set to protect human health, particularly sensitive receptors such as children, the elderly, and individuals that suffer from chronic lung conditions such as asthma and emphysema. Secondary standards were set to protect the natural environment and prevent further deterioration of animals, crops, vegetation, and buildings.

The NAAQS are defined as the maximum acceptable concentration that may be reached, but not exceeded, more than once per year. California has adopted more stringent ambient air quality standards (i.e., CAAQS) for most of the criteria air pollutants, which also are designed to protect human health. Emission levels above the NAAQS and/or CAAQS are levels that could create adverse effects on human health.

Table 3.3-2 presents both sets of ambient air quality standards (i.e., national and State) and provides the attainment status in Shasta County for each. California also has established State ambient air quality standards for sulfates, hydrogen sulfide, and vinyl chloride; however, air emissions of these pollutants are not expected under the Project or alternatives and are not further discussed in this EIR.

Shasta County is classified as a non-attainment area for the State 1-hour and 8-hour ozone standards. For all other criteria pollutants, the County is classified as either unclassified or as attainment with respect to State and federal standards; however, the rest of the Air Basin is classified as non-attainment of the State PM_{10} standards (CARB, 2016). The NAAQS and CAAQS are applicable to this analysis because the Project could impact the attainment status of ozone or PM_{10} in the Air Basin.

Federal

The USEPA is responsible for implementing programs established under the federal Clean Air Act (CAA), such as establishing and reviewing the NAAQS and judging the adequacy of State Implementation Plans (SIPs), but has delegated the authority to implement many of the federal programs to the states while retaining an oversight role to ensure that the programs continue to be implemented.

State

CARB is responsible for establishing and reviewing the State standards, compiling the California SIP and securing approval of that plan from USEPA, conducting research and planning, and identifying TACs. CARB also regulates mobile sources of emissions in California, such as construction equipment, trucks, and automobiles, and oversees the activities of California's air quality districts, which are organized at the county or regional level. County or regional air quality management districts are primarily responsible for regulating stationary sources at industrial and commercial facilities within their geographic areas and for preparing the air quality plans that are required under the federal CAA and California CAA.

TABLE 3.3-2
NAAQS/CAAQS AND ATTAINMENT STATUS FOR SHASTA COUNTY

Criteria Pollutant	Averaging Time	State Standard	Shasta County Attainment Status for California Standard	Federal Primary Standard	Shasta County Attainment Status for Federal Standard
Ozone	8 Hour	0.070 ppm	Non-Attainment	0.070 ppm	Attainment
	1 Hour	0.09 ppm	Non-Attainment	---	---
Carbon Monoxide	8 Hour	9.0 ppm	Unclassified	9 ppm	Attainment
	1 Hour	20 ppm	Unclassified	35 ppm	Attainment
Nitrogen Dioxide	Annual Average	0.030 ppm	Attainment	0.053 ppm	Attainment
	1 Hour	0.18 ppm	Attainment	0.100 ppm	Attainment
Sulfur Dioxide	Annual Average	---	---	0.030 ppm	Attainment
	24 Hour	---	---	0.14 ppm	Attainment
	1 Hour	---	---	0.075 ppm	Attainment
Respirable Particulate Matter (PM_{10})	Annual Arithmetic Mean	20 mg/m^3	Attainment*	---	---
	24 Hour	50 mg/m^3	Attainment*	150 mg/m^3	Attainment
Fine Particulate Matter ($PM_{2.5}$)	Annual Arithmetic Mean	12 mg/m^3	Attainment	12.0 mg/m^3	Attainment
	24 Hour	---	---	35 mg/m^3	Attainment
Lead	3-Month Rolling Average	---	---	0.15 mg/m^3	Attainment
Hydrogen Sulfide	1 Hour	0.03 ppm/ 42 $\mu g/m^3$	Unclassified	---	---
Sulfates	24 Hour	25 mg/m^3	Attainment	---	---
Vinyl Chloride	24 Hour	0.01 ppm/ 26 $\mu g/m^3$	Attainment	---	---

NOTES:

* Although Shasta County is in attainment of State PM_{10} standards, the rest of the Air Basin in non-attainment of State PM_{10} standards; ppm = parts per million; $\mu g/m^3$ = micrograms per cubic meter; mg/m^3 = milligrams per cubic meter; --- = no applicable standard; PM_{10} = particulates of 10 microns or less; $PM_{2.5}$ = particulates of 2.5 microns or less.

SOURCES: CARB, 2016, 2019b; USEPA, 2020.

California's Diesel Risk Reduction Plan / Diesel Fuel Regulations

As part of California's Diesel Risk Reduction Plan, CARB has passed numerous regulations to reduce diesel emissions from vehicles and equipment that are already in use. Combining these retrofit regulations with new engine standards for diesel fueled vehicles and equipment, CARB intends to reduce DPM emissions by 85 percent from year 2000 levels by 2020. California Diesel Fuel Regulations (13 Cal. Code Regs. §§2281–2285; 17 Cal. Code Regs. §93114) provide standards for diesel motor vehicle fuel and non-vehicular diesel fuel.

CARB also has adopted regulations for on road vehicles with a gross vehicular weight rating of 10,000 pounds or greater shall not idle for longer than 5 minutes at any location (13 Cal. Code Regs. §2485). This restriction does not apply when vehicles remain motionless during traffic or

when vehicles are queuing. Off-road equipment regulations adopted by CARB require that all engines shall not idle for longer than 5 minutes (13 Cal. Code Regs. §2449[d][3]). Exceptions to this rule include: idling when queuing; idling to verify that the vehicle is in safe operating condition; idling for testing, servicing, repairing, or diagnostic purposes; idling necessary to accomplish work for which the vehicle was designed (such as operating a crane); and idling required to bring the machine to operating temperature as specified by the manufacturer. The Diesel Risk Reduction Plan and diesel fuel regulations are applicable because the Project would generate diesel fuel exhaust emissions during construction.

Local

Northern Sacramento Valley Planning Area 2018 Triennial Air Quality Attainment Plan

The air districts for the counties of Shasta, Tehama, Butte, Glenn, Colusa, Sutter, and Yuba have established the Northern Sacramento Valley Planning Area (NSVPA). The NSVPA air districts were designated as non-attainment for the ozone CAAQS and have jointly prepared an air quality attainment plan to attain the ozone CAAQS standard by the earliest practicable date. The NSVPA air districts jointly prepared the original 1991 Air Quality Attainment Plan, and have since prepared triennial updates to the plan. The latest update is referred to as the 2018 Triennial Air Quality Attainment Plan (2018 Plan). The 2018 Plan includes an assessment of progress towards achieving the control measure commitments in the previous plan, a summary of ozone data, emission reductions for measures committed to in the previous plan, updated control measure commitments, and updated growth rates. The NSVPA air districts also administer several grant programs that achieve emission reductions in addition to stationary and area-wide control measures. These incentive programs are voluntary and often target mobile sources, of which comprise the majority of the NO_x emission inventory, yet the districts have no regulatory authority over. There are no control measures or grant programs that would be directly applicable to the Project (SVAQEEP, 2018).

Shasta County General Plan

The Air Quality Element of the Shasta County General Plan includes the following policies designed to reduce air pollutant emissions in the County (Shasta County, 2004):

> **Policy AQ-1e:** The County shall require new air pollution point sources such as, but not limited to, industrial, manufacturing, and processing facilities to be located an adequate distance from residential areas and other sensitive receptors.
>
> **Policy AQ-2a:** The County will cooperate with the AQMD, CARB, and the Regional Transportation Planning Agency in implementing programs designed to comply with provisions of Federal and State Clean Air Acts and the County's Air Quality Attainment Plan.
>
> **Policy AQ-2b:** The County will work to accurately determine and fairly mitigate the local and regional air quality impacts of projects proposed in the unincorporated portions of Shasta County.
>
> **Policy AQ-2c:** Land use decisions, where feasible, should contribute to the improvement of air quality. New projects shall be required to reduce their respective air quality impacts to below levels of significance, or proceed as indicated in Policy AQ-2e.

Policy AQ-2d: Shasta County shall ensure that air quality impacts identified during CEQA review are: (1) consistently and fairly mitigated, and (2) mitigation measures are feasible.

Policy AQ-2e: Shasta County will cooperate with the AQMD in assuring that new projects with stationary sources of emissions of non-attainment pollutants or their precursors that exceed 25 tons per year shall provide appropriate emission offsets. A comparable program which offsets indirect emissions of these pollutants exceeding 25 tons per year from development projects shall also be utilized to mitigate air pollution impacts. An Environmental Impact Report will be required for all projects that have unmitigated emissions of non-attainment pollutants exceeding 25 tons per year.

Policy AQ-2f: Shasta County shall require appropriate Standard Mitigation Measures and Best Available Mitigation Measures on all discretionary land use applications as recommended by the AQMD in order to mitigate both direct and indirect emissions of non-attainment pollutants.

Policy AQ-2g: Significance thresholds as proposed by the AQMD for emissions shall be utilized when appropriate for: (1) ROG and NO_x, both of which are precursors of ozone, and (2) PM_{10} in determining mitigation of air quality impacts.

Policy AQ-2h: Shasta County shall evaluate AQMD data annually to determine if the air quality impacts of development projects that may be insignificant by themselves are cumulatively significant.

Policy AQ-4b: The County's development standards shall require the paving of roads as a part of new development permits to the extent necessary to meet access and air quality objectives. These requirements shall be designed to help mitigate potentially significant adverse air quality impacts created by particulate emissions on both an individual and cumulative basis.

Shasta County AQMD Rules

The Shasta County AQMD enforces the following rules that may be applicable to the Project to limit the generation of air pollutants in Shasta County:

Rule 3:2: Specific Air Contaminants. This rule establishes limits to the amount of pollutants that may be discharged into the atmosphere.

Rule 3:16: Fugitive, Indirect, or Non-Traditional Sources. This rule established conditions upon any source, including sources of construction-related fugitive dust, to mitigate the emissions from such sources to below a level of significance or to a point that such emissions no longer constitute a violation of the California Health & Safety Code Section 41700 and/or Section 41701.

Rule 3:28: Stationary Internal Combustion Engines: The provisions of this rule apply to any gaseous, diesel, or any other liquid-fueled stationary internal combustion engine within the boundaries of the AQMD. The emissions limits identified by this rule are not applicable to emergency standby engines as approved by the Air Pollution Control Officer (APCO); however, the rule does require that testing and maintenance for emergency generators be limited to no more than 100 hours per year.

Rule 3:31: Architectural Coatings. This rule limits the quantity of volatile organic compounds (VOCs)[1] in architectural coatings supplied, sold, offered for sale, applied, solicited for application, or manufactured for use within Shasta County.

Rule 3:32: Adhesives and Sealants. This rule limits the emission of VOCs from adhesives and sealants and associated primers, and from related surface preparation solvents, cleanup solvents, and strippers.

3.3.2 Significance Criteria

CEQA Guidelines Appendix G Section III identifies considerations relating to air quality. See Section 3.1.4, *Environmental Considerations Unaffected by the Project or Not Present in the Project Area*, as it relates to the County's analysis of the potential impacts of this Project to some of the air quality considerations suggested in CEQA Guidelines Appendix G. Otherwise, for purposes of this analysis, a project would result in a significant impact to air quality if it would:

a) Conflict with or obstruct implementation of the applicable air quality plan;

b) Result in a cumulatively considerable net increase of any criteria pollutant for which the Project region is non-attainment under an applicable federal or state ambient air quality standard;

c) Expose sensitive receptors to substantial pollutant concentrations; or

d) Result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

The CEQA Guidelines Appendix G Checklist (Section III, *Air Quality*) states that the significance criteria established by the applicable air quality management district or air pollution control district may be relied on to make the determinations for the above criteria. The AQMD has established air pollution emissions criteria for determining the significance of an impact during project construction and operation, and these thresholds have been used to evaluate the impacts of the Project on air quality. The AQMD requests that lead agencies apply standard mitigation measures and best available mitigation measures to the project as listed in the General Plan Air Quality Element. The standard mitigation measures are applied to all projects, while the list of best available mitigation measures are reviewed by the planning agency staff for consideration of a specific project. The County General Plan does not include construction-related air quality mitigation measures; however, the AQMD has recommended standard mitigation measures for the Project (AQMD, 2018). As described in **Table 3.3-3**, Shasta County has two levels of emission thresholds that are used to determine the appropriate level of required best available mitigation measures.

If the Project's emissions are greater than the Level A thresholds but less than Level B thresholds, appropriate mitigation should be implemented and the impact would be less than significant. If emissions exceed the Level B thresholds after the application of mitigation measures, then the Project would be considered to have a significant air quality impact.

[1] For the purposes of this analysis, volatile organic gases (VOCs) and reactive organic gases (ROG) are equivalent.

TABLE 3.3-3
SHASTA COUNTY EMISSIONS THRESHOLDS (POUNDS/DAY)

Significance Threshold Levels		NO_x	PM_{10}
A	25	25	80
B	137	137	137

NOTES:
ROG = reactive organic gases; NO_x = nitrogen oxides; PM_{10} = Particulate matter less than or equal to 10 microns in diameter.

SOURCE: AQMD, 2003a

3.3.3 Direct and Indirect Effects

3.3.3.1 Approach to Analysis

Shasta County is classified as a non-attainment area for the State ozone standards; and although the County is in attainment of State PM_{10} standards, the rest of the Air Basin in non-attainment of State PM_{10} standards. Therefore, the AQMD has adopted CEQA thresholds of significance for ROG, NO_x, and PM_{10} for both short-term construction and long-term project operations as identified in Table 4.3-3, above. The AQMD has determined that an exceedance of the Level B threshold for either NO_x or ROG or both of these precursors indicates that a project would cumulatively jeopardize attainment of ozone standards and that an exceedance of the Level B threshold for PM_{10} indicates that a project would cumulatively jeopardize attainment of PM_{10} standards. An exceedance of the ozone and/or PM_{10} standards would result in a significant adverse impact on air quality.

Criteria pollutant emissions from construction equipment, vehicle, and helicopter exhaust and generation of particulate matter in the form of fugitive dust are the primary concerns in evaluating the short-term (i.e., construction, decommissioning, and site reclamation) air quality impacts of the Project. Short-term Project activities that would result in air quality impacts include: timber removal and grubbing, grading and access road work; concrete batch plant activities; turbine, transformer, substation, and O&M building foundation work; turbine and transformer installation; substation and O&M building installation; installation of the underground and overhead collector systems; connection with PG&E infrastructure; and installation of the substation aggregate and security fencing. While long-term impacts associated with criteria pollutants were also evaluated, these would not be significant since emission-related activities associated with Project operations and maintenance would be limited to commuting workers trips, crane-related maintenance activities, and periodic emergency generator testing.

Exhaust pollutants would be emitted during construction, decommissioning, and site reclamation activities from a variety of construction and earth-moving equipment, including motor-driven construction equipment, a helicopter, construction vehicles, and workers' vehicles. Fugitive dust would be generated by ground disturbing activities (e.g., site grading and foundation excavation), as well as from heavy truck travel on paved and unpaved roads, concrete batch plant activities, and helicopter landings and takeoffs.

3.3.3.2 Direct and Indirect Effects of the Project

a) Whether the Project would conflict with or obstruct implementation of the applicable air quality plan.

Impact 3.3-1: Construction, decommissioning, and site reclamation activities would generate pollutant emissions that could conflict or obstruct implementation of the applicable air quality plan. (*Less than Significant with Mitigation Incorporated*)

The Project would be under the jurisdiction of the AQMD. The AQMD has partnered with air districts from other counties, including Tehama, Butte, Glenn, Colusa, Sutter, and Yuba to form the NSVPA. The NSVPA's most recently prepared air quality attainment plan is the 2018 Plan to attain the ozone CAAQS standards. Construction, decommission, and site reclamation activities of the Project would be short-term and conducted in compliance with applicable federal, state, and local requirements. Project construction, decommissioning, and site reclamation activities have the potential to generate temporary ozone precursor emissions through the use of heavy-duty construction equipment, such as excavators and graders, through the use of a helicopter, and through vehicle trips generated from worker trips and haul trucks traveling to and from the Project Site. Construction emissions can vary substantially from day to day, depending on the level of activity, the specific type of construction activity, and prevailing weather conditions. The assessment of construction, decommissioning, and site reclamation air quality impacts considers each of these potential sources (see Impact 3.3-2).

To determine if a project would conflict with or obstruct implementation of the applicable air quality plan, lead agencies must demonstrate that a project would not directly obstruct implementation of an applicable air quality plan and that a project be consistent with the assumptions (typically land-use related) upon which the air quality plan is based. The Project would result in an increase in short-term employment compared to existing conditions. Being relatively small in number (approximately 400 workers per day) and temporary in nature, construction jobs under the Project construction, decommissioning, and site reclamation phases would not conflict with the long-term employment projections upon which the 2018 Plan is based. There are no control measures or grant programs that would be directly applicable to the Project; however, as described under Impact 3.3-2, the Project would result in a significant impact associated with construction, decommissioning, and site reclamation emissions of NO_x, a precursor to ozone. Therefore, although the Project would not directly conflict with implementation of the 2018 Plan measures or grant programs, it could result in a violation of an ozone air quality standard, which would not be consistent with the intent of the 2018 Plan. With implementation of Mitigation Measures 3.3-1a (Tier 4 Final Emission Standards for Off-road Construction Equipment) and 3.3-1b (Idling Restrictions and Fuel Use), NO_x emissions would be reduced to less than the applicable Level B significance threshold and would not have a substantial effect on the regional and localized air quality in the Air Basin, and it would not conflict or obstruct implementation of the 2018 Plan. This impact would be reduced to **less than significant**.

Long-term operation of the Project would result in insignificant ozone precursor emissions from worker automobile trips, maintenance with cranes, and emergency generator testing. Exhaust emissions from these trips, cranes, and testing would be less than significant (see Impact 3.3-3).

Furthermore, operations of the Project would be consistent with the applicable growth projections and control strategies used in the development of the 2018 Plan and would not jeopardize attainment of the air quality levels identified in the 2018 Plan because it would not be considered growth inducing (see Section 3.1.4.11, *Population and Housing, Growth Inducing*). For these reasons, long-term operations of the Project would not conflict with or obstruct the implementation of the 2018 Plan. No impact would result from the proposed operation and maintenance activities.

Mitigation Measure 3.3-1a: Tier 4 Final Emission Standards for Off-road Construction Equipment.

The Applicant (and/or its construction contractor[s]) shall require that all diesel-fueled off-road construction equipment of more than 50 horsepower used at the Project Site during construction, decommissioning, and/or reclamation activities meet USEPA Tier 4 Final emission standards. A compliance log shall be maintained by the Applicant and made available to the Shasta County Department of Resource Management upon request.

Mitigation Measure 3.3-1b: Idling Restrictions and Fuel Use.

To ensure that idling time for on road vehicles with a gross vehicular weight rating of 10,000 pounds or greater does not exceed the five-minute limit established in Section 2485 of Title 13 California Code of Regulations, and that idling time for off-road engines does not exceed the five-minute limit established in Title 13 California Code of Regulations Section 2449(d)(3), the Applicant and/or its construction contractor(s) shall prepare and implement a written idling policy and distribute it to all equipment operators. Clear signage of these requirements shall be provided for construction workers at all access points to construction areas.

The Applicant shall use CARB-certified alternative fueled (compressed natural gas [CNG], liquid propane gas [LPG], electric motors, or other CARB certified off-road technologies) engines in construction equipment where feasible.

Significance after Mitigation: Less than significant.

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b) Whether the Project would result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable federal or state ambient air quality standard.

Construction of the Project would generate emissions of criteria air pollutants over a construction period of up to 21 months (two years with no construction in January through March); however, during this period there would be no construction during January through March due to winter conditions. Exhaust emissions would result from construction equipment and machinery, a helicopter, as well as from vehicular traffic generated by construction activities. Fugitive dust emissions would result from entrained particulates that become airborne from vehicles traveling on unpaved roadway surfaces at the site and paved roadway surfaces off-site, concrete batch plant activities, helicopter landings and takeoffs, and earthwork activities, including site grading and foundation excavation. Emission levels for the various construction activities would vary with the type of equipment, duration of use, operation schedules, and size of the construction labor force.

As part of the County's Use Permit application process, the Applicant provided equipment assumptions for the construction phases that would occur during each of the 2 years of construction, including the types of construction equipment that would be required, the amounts of each type, overall duration of equipment operator daily work hours, workdays per week, and total number of workdays. Based on the overall duration of equipment operator daily work hours (i.e., 10 hours), it is estimated that each piece of equipment, including the helicopter, would operate up to 8 hours per workday, to account for breaks, lunch hour, refueling, etc., with the exception of for cranes and boom lifts, which are assumed to operate up to 4 hours per day.

In addition, the Applicant prepared a traffic study (**Appendix H**, *Transportation*) that the County independently reviewed and determined to be suitable for reliance in combination with other sources of data to inform this analysis. The traffic study identifies total construction-related vehicle miles travelled (VMT) that would be associated with commuting workers as well as haul truck trips that would be required to deliver equipment and materials to the Project Site (Westwood, 2020). The trip lengths were estimated based on origins from Port of Stockton (270 miles), Redding (50 miles), Burney (20 miles), and the small towns east of the Project Site (10 miles). Subsequent to the preparation of the traffic study, the Applicant provided additional trips data for the proposed timber removal and grubbing activities. The VMT values identified in the traffic study and provided by the Applicant were doubled to reflect one-way trips, and then were used to generate worker and haul truck trip and mileage rates for each of the construction phases during the 2 years of construction.

As shown in Section 3.14, *Transportation*, Table 3.14-5, all roadway segments along Highway 299 in the vicinity of the Project Site entrances would continue to operate at an acceptable level of service (LOS) according to California Department of Transportation and Shasta County standards (LOS C or better) with the addition of Project construction traffic; therefore, secondary impacts from increased vehicle emissions due to delays resulting from traffic controls and lane closures would not be expected.

It should be noted that the trips from the Port of Stockton for the turbine-related deliveries would pass through seven air district jurisdictions, including the AQMD, Tehama County Air Pollution Control District (TCAPCD), Glenn County Air Pollution Control District (GCAPCD), Colusa County Air Pollution Control District (CCAPCD), Yolo-Solano Air Quality Management District (YSAQMD), Sacramento Metropolitan Air Quality Management District (SMAQMD), and San Joaquin Valley Air Pollution Control District (SJVAPCD). The pollutant emissions associated with these trips were allocated according to the relevant air districts, and compared to the applicable jurisdiction's significance criteria.

The Project emissions were estimated by the EIR preparers (identified in Chapter 5, *Report Preparation*) using the California Emissions Estimator Model (CalEEMod) version 2013.3.2. This version of CalEEMod calculates the construction equipment exhaust emissions based on CARB's OFFROAD2011 model emission and load factors, and calculates fugitive dust, including from ground disturbance and paved and unpaved road vehicle travel, using factors from USEPA's AP-42, *Compilation of Air Emission Factors*, and other sources. To estimate on-road mobile exhaust emissions, CalEEMod version 2013.3.2 uses vehicle emission factors from an outdated

version of CARB's Emfac model (2014); therefore, the CalEEMod "off-site" vehicle emissions estimates were not used in this analysis, and the Project on-road vehicle exhaust emissions were estimated outside of CalEEMod using emissions factors obtained from the latest version of the Emfac model, released in 2017. Helicopter emissions that would be associated with conductor stringing for the overhead collection system and transmission line connection were estimated manually using emissions factors obtained from the Swiss Federal Office of Civil Aviation (FOCA) (2015).[2] For all the air pollutant emissions assumptions and calculations, see Appendix B.

Construction-related fugitive dust emissions were estimated using the CalEEMod model. For the purposes of this analysis, it is assumed that all grading and access road work would occur over a period of 160 workdays during the first year of construction. These grading activities would disturb an estimated 1,384 acres. Excavation activities for installation of the turbine foundations are assumed to result in handling of 256,000 cubic yards of excavated material. These excavation activities would happen over a 70-day period and would also occur during the first year of construction, partially overlapping with the grading activities. With regard to vehicle travel on unpaved roads, it is assumed that workers would park at the O&M building site or at one of the various laydown/staging areas at the site. The O&M building site is approximately 0.5 mile from the paved highway and the various laydown/staging areas are estimated to average 6 miles from the highway, which represents the approximate center of the Project Site. Assuming equal amounts of workers would park at the O&M building site and at the various laydown/staging sites, it is assumed that each worker trip would result in an average of 3.25 miles of unpaved road travel. For haul truck trips that would be required for timber removal and grubbing (80 workdays during first year of construction), grading and access work (160 workdays during first year of construction), concrete deliveries (70 workdays during first year of construction), turbine and transformer installation (100 workdays during second year of construction), substation and O&M building installation (160 workdays during second year of construction), and aggregate and the security fence installation (15 workdays during second year of construction), it is assumed that each trip would require an average of 6 miles of unpaved road travel from the paved highway.

Two scenarios were used to estimate emissions that would be associated with the Project's use of approximately 37,000 cubic yards of concrete. One scenario assumed the concrete would be trucked to the site via 3,805 truck deliveries from Redding, and the other assumed that the concrete would be batched as part of the Project at several plants onsite. Fugitive dust emissions that would be associated with the concrete batch plants were estimated using emission factors from USEPA's AP-42, Section 11.12, *Concrete Batching* (USEPA, 2012), and the exhaust emissions that would be associated with equipment used to run the batch plants were estimated using the CalEEMod model. Although the onsite concrete batch plants would generate slightly higher exhaust emissions than trucking the concrete to the site, the fugitive dust emissions that would be associated with unpaved road travel from trucking the concrete to the site would be substantially greater than the fugitive dust emissions that would be associated with batching the

[2] FOCA emission factors are one of the main sources for helicopter emission factors used in CEQA reviews. The Federal Aviation Administration maintains the Aviation Environmental Design Tool (AEDT), which is used by the U.S. government to consider the interdependencies between aircraft-related fuel burn, noise, and emissions; however, the AEDT database is incomplete with regard to helicopter emission factors.

concrete onsite. Therefore, for a conservative analysis, it is assumed that the concrete would be trucked to the site from Redding.

According to the Applicant, the Project would be completed in the following phases: timber removal and grubbing, grading and access road work; concrete batch plant activities; turbine, transformer, substation, and O&M building foundations; turbine and transformer installation; substation and O&M building installation; underground collector system; overhead collection systems; the transmission line connection; and substation aggregate and security fencing. To estimate peak daily Project construction emissions, the construction phases that could overlap in schedule, i.e., occur simultaneously, were identified to estimate the combined total estimated peak daily emissions. Based on the Applicant's identified proposed construction phases, concurrent construction activities for each Project component that would emit the greatest amount of daily emissions during the first and second year of construction would be as follows.

First Year of Construction:

- *Timber Removal and Grubbing; and*
- *Grading and Access Road Work.*

Second Year of Construction:

- *Turbine and Transformer Installation*;
- *Substation and O&M Building Installation*;
- *Underground Collector System*; and
- *Overhead Collection Systems*.

Table 3.3-4, *Unmitigated Project Peak Daily Construction Emissions,* presents the estimated peak daily construction emissions that would be associated with the Project. These emissions would be dispersed throughout the study area at the various Project component sites. As shown in the table, the maximum peak daily construction emission would occur during the first year of construction, and would primarily be associated with grading and access road work for exhaust emissions and timber removal and grubbing for fugitive dust. For information on the types and amounts of construction equipment that would be used to construct the Project, refer to Table 2-2, *Construction Equipment List*, in Chapter 2. It is anticipated that the peak daily emissions that would be associated with decommissioning and site reclamation activities for the Project would be similar to the emissions estimated for the construction of the Project because similar construction equipment would likely be required for those activities. Therefore, this impact analysis is applicable to both Project construction, decommissioning, and site reclamation.

Turbine and transformer installation vehicle trip emissions presented in Table 3.3-4 represent only the portion of the trips that would occur within Shasta County AQMD's jurisdiction. The emissions associated with the portion of those trips that would be generated in the other six air district jurisdictions, including the TCAPCD, GCAPCD, CCAPCD, YSAQMD, SMAQMD, and SJVAPCD, have been evaluated and are presented in Table 3.3-6 (see the Impact 3.3-2d discussion, below).

TABLE 3.3-4
PROJECT PEAK DAILY CONSTRUCTION EMISSIONS WITHIN THE AQMD JURISDICTION

Phase	Source	ROG	NO_x	PM_{10}			$PM_{2.5}$		
				Exh.	Dust	Total	Exh.	Dust	Total
Peak Construction Emissions - First Year (pounds/day)									
Timber Removal and Grubbing	Equipment	7	62	2	0	2	2	0	2
	Vehicles	4	52	1	1,739	1,740	0	174	174
Grading and Access Road Work	Equipment	21	208	9	45	54	8	21	29
	Vehicles	4	43	2	1,062	1,064	1	107	108
Total		**35**	**365**	**14**	**2,846**	**2,860**	**12**	**302**	**313**
Peak Construction Emissions - Second Year (pounds/day									
Turbine and Transformer Installation	Equipment	6	67	3	0	3	3	0	3
	Vehicles**	1	39	1	527	528	1	55	55
Substation and O&M Building Installation	Equipment	1	10	0	0	0	0	0	0
	Vehicles	1	3	1	595	596	0	60	61
Underground Collector System	Equipment	3	32	2	6	8	2	3	5
	Vehicles	0	0	0	179	179	0	18	18
Overhead Collection System	Equipment	3	34	2	0	2	1	0	1
	Vehicles	0	0	0	179	179	0	18	18
	Helicopter	13	19	1	10	10	1	1	1
Total		**29**	**205**	**9**	**1,497**	**1,506**	**8**	**154**	**162**
Level A Significance Thresholds		**25**	**25**	**--**	**--**	**80**	**--**	**--**	**--**
Level B Significance Thresholds		**137**	**137**	**--**	**--**	**137**	**--**	**--**	**--**

NOTES: Emissions amounts may not add perfectly due to rounding error.

* For a conservative analysis, it is assumed that the concrete would be trucked to the site from Redding, therefore the emissions that would be associated with batching the concrete onsite (equipment row) have been netted out of the total emission values.

** Turbine and transformer installation vehicle emissions represent only the portion of the trips that would occur within Shasta County AQMD's jurisdiction.

SOURCE: Appendix B

Impact 3.3-2a: Construction, decommissioning, and site reclamation activities would generate ROG emissions that could result in a cumulatively considerable net increase of ozone, for which the Project region is non-attainment of State ambient air quality standards. (*Less-than-Significant Impact*)

The AQMD has two thresholds: Level A and Level B. An exceedance of the Level B threshold for either NOx or ROG (or both of these precursors) indicates that a project would cumulatively jeopardize attainment of ozone standards, and so result in a significant impact. An exceedance of the Level A threshold merits further consideration, but would not be considered to be a significant adverse CEQA impact. The estimated ROG emissions that would be generated within the AQMD (as presented in Table 3.3-4) show that the Project's mass emissions would not exceed the Level B threshold. Therefore, ROG emissions generated by the Project within the AQMD would not be expected to result in a cumulatively considerable net increase in regional ozone emissions. Construction, decommissioning, and site reclamation impacts associated with the generation of ROG emissions would therefore be **less than significant**.

The AQMD recommends that projects with emissions greater than the Level A thresholds, but less than Level B thresholds, include measures to further reduce impacts. As noted, the Project's ROG emissions would not result in a significant impact. Nonetheless, the implementation of Mitigation Measures 3.3-1a and 3.3-1b (which are recommended to reduce significant impacts associated with NO_x emissions pursuant to Impact 3.3-1, above), would also reduce peak ROG emissions to less than 25 pounds per day (see Appendix B).

Table 3.3-5, *Mitigated Project Peak Daily Construction Emissions*, presents the estimated peak daily construction emissions that would be associated with the Project with implementation of Mitigation Measures 3.3-1a, 3.3-1b, and 3.3-2c.

TABLE 3.3-5
MITIGATED PROJECT PEAK DAILY CONSTRUCTION EMISSIONS WITHIN THE AQMD JURISDICTION

Phase	Source	ROG	NO_x	PM_{10}			$PM_{2.5}$		
				Exh.	Dust	Total	Exh.	Dust	Total
Peak Construction Emissions - First Year (pounds/day)									
Timber Removal and Grubbing	Equipment	2	8	0	0	0	0	0	0
	Vehicles	4	52	1	280	281	0	28	29
Grading and Access Road Work	Equipment	4	17	1	20	21	1	9	10
	Vehicles	4	43	2	175	177	1	8	9
Total		**13**	**120**	**4**	**475**	**479**	**2**	**45**	**48**
Peak Construction Emissions - Second Year (pounds/day)									
Turbine and Transformer Installation	Equipment	1	6	0	0	0	0	0	0
	Vehicles**	2	39	1	61	62	1	8	9
Substation and O&M Building Installation	Equipment	0	3	0	0	0	0	0	0
	Vehicles	1	3	1	63	63	0	7	7
Underground Collector System	Equipment	1	7	0	3	3	0	1	2
	Vehicles	0	0	0	18	18	0	2	2
Overhead Collection System	Equipment	1	8	0	0	0	0	0	0
	Vehicles	0	0	0	18	18	0	2	2
	Helicopter	13	19	1	10	10	1	1	1
Total		**18**	**85**	**3**	**172**	**175**	**2**	**21**	**23**
Level A Significance Thresholds		**25**	**25**	**--**	**--**	**80**	**--**	**--**	**--**
Level B Significance Thresholds		**137**	**137**	**--**	**--**	**137**	**--**	**--**	**--**

NOTES: Emissions amounts may not add perfectly due to rounding error.

* For a conservative analysis, it is assumed that the concrete would be trucked to the site from Redding, therefore the emissions that would be associated with batching the concrete onsite (equipment row) have been netted out of the total emission values.

** Turbine and transformer installation vehicle emissions represent only the portion of the trips that would occur within Shasta County AQMD's jurisdiction.

SOURCE: Appendix B

Impact 3.3-2b: Construction, decommissioning, and site reclamation activities would generate NO_x emissions that could result in a cumulatively considerable net increase of ozone, for which the Project region is non-attainment of State ambient air quality standards. (*Less than Significant with Mitigation Incorporated*)

As shown in Table 3.3-4, total peak daily emissions of NOx would be as high as 292 pounds, which would exceed the Level B significance threshold, resulting in a significant impact. If all off-road construction equipment that would operate at the site were required to be Tier 4 compliant, the total peak daily construction emissions of NOx would be reduced to 120 pounds, less than the significance threshold (see Appendix B). As shown in Table 3.3-5, implementation of Mitigation Measures 3.3-1a (Tier 4 Final Emission Standards for Off-road Construction Equipment) and 3.3-1b (Idling Restrictions and Fuel Use) would reduce maximum construction-, decommissioning-, and site reclamation-related emissions of NOx to less than the 137 pounds-per-day significance threshold. The maximum daily emission would be reduced as a result of the Applicant/construction contractor(s) using off-road construction equipment that would meet USEPA's most stringent emissions standards for NOx (i.e., Tier 4). Therefore, the impact associated with the generation of NOx emissions to result in a cumulatively considerable net increase in regional ozone emissions would be less than significant with mitigation incorporated.

> **Mitigation:** Implement Mitigation Measures 3.3-1a (Tier 4 Final Emission Standards for Off-road Construction Equipment) and 3.3-1b (Idling Restrictions and Fuel Use)
>
> **Significance after Mitigation:** Less than significant.

Impact 3.3-2c: Construction, decommissioning, and site reclamation activities would generate PM_{10} emissions that would result in a cumulatively considerable net increase of PM_{10}, which the Project region is non-attainment of State ambient air quality standards. (*Significant and Unavoidable*)

As shown in Table 3.3-4, total emissions of PM_{10} would exceed the Level B significance threshold, resulting in a significant impact. Mitigation Measure 3.3-2c (Fugitive Dust Controls; see below), would require the Applicant to implement feasible fugitive dust controls. Implementation of Mitigation Measure 3.3-2c would reduce fugitive dust emissions associated with travel on unpaved surfaces by 84 percent and associated with ground disturbance by 55 percent (South Coast AQMD, 2007), but as shown in Table 3.3-5, peak daily emissions would continue to exceed the significance threshold at 479 pounds (see Appendix B); hence, the impact relative to the potential for the Project to generate emissions that would result in a cumulatively considerable net increase in regional PM_{10} emissions would be **significant and unavoidable**.

> **Mitigation Measure 3.3-2c: Fugitive Dust Controls.**
>
> The following AQMD Standard Mitigation Measures for fugitive dust shall be implemented during the construction, decommissioning, and reclamation phases by the Applicant and/or its contractor(s):
>
> - Options to open burning of vegetative material on the Project Site shall be used by the Applicant unless otherwise deemed infeasible by the AQMD. Examples of suitable options are chipping, mulching, and conversion to biomass fuel.

- The Applicant shall be responsible for ensuring that all adequate dust control measures are implemented in a timely and effective manner during all phases of Project development and construction.
- All material excavated, stockpiled, or graded should be sufficiently watered to prevent fugitive dust from leaving property boundaries and causing a public nuisance or a violation of an ambient air standard. Watering should occur at least twice daily with complete site coverage, preferably in the mid-morning and after work is completed each day.
- All areas (including unpaved roads) with vehicle traffic should be watered periodically or have dust palliatives applied for stabilization of dust emissions.
- All onsite vehicles should be limited to a speed of 15 miles per hour on unpaved roads.
- All land clearing, grading, earth moving, and excavation activities on the Project Site shall be suspended when winds are expected to exceed 20 miles per hour.
- All inactive portions of the development site should be seeded and watered until suitable grass cover is established.
- The Applicant shall be responsible for applying (according to manufacturer 's specifications) nontoxic soil stabilizers to all inactive construction areas (previously graded areas that remain inactive for 96 hours) in accordance with the Shasta County Grading Ordinance.
- All trucks hauling dirt, sand, soil, or other loose material should be covered or should maintain at least 2 feet of freeboard (i.e., minimum vertical distance between top of the load and top of the trailer) in accordance with the requirements of California Vehicle Code Section 23114. This provision shall be enforced by local law enforcement agencies.
- All material transported off site shall be either sufficiently watered or securely covered to prevent a public nuisance.
- During initial grading, earth moving, or site preparation, the Applicant shall be required to construct a paved (or dust palliative-treated) apron, at least 100 feet in length, onto the Project Site from the adjacent paved Highway 299.
- Paved streets adjacent to the development site should be swept or washed at the end of each day to remove excessive accumulations of silt and/or mud that may have accumulated as a result of activities on the development site.
- Adjacent paved streets shall be swept at the end of each day if substantial volumes of soil materials have been carried onto adjacent public paved roads from the Project Site.
- Wheel washers shall be installed where project vehicles and/or equipment enter and/or exit onto paved streets from unpaved roads. Vehicles and/or equipment shall be washed prior to each trip.
- Prior to final occupancy, the applicant shall reestablish ground cover on the construction site through seeding and watering in accordance with the Shasta County Grading Ordinance.

Significance after Mitigation: Significant and unavoidable.

Impact 3.3-2d: Construction, decommissioning, and site reclamation activities would not result in cumulatively considerable net increases of criteria pollutants in other air district jurisdictions. (*Less-than-Significant Impact*)

As discussed previously, haul trips required from the Port of Stockton for the turbine-related deliveries to the Project Site would pass through six other air district jurisdictions in addition to the AQMD, including TCAPCD, GCAPCD, CCAPCD, YSAQMD, SMAQMD, and SJVAPCD. The estimated pollutant emissions associated with those trips that would be generated within each of air district jurisdictions are presented in **Table 3.3-6** and are compared to the jurisdiction's significance criteria, where criteria have been adopted. As shown in the table, the emissions would exceed none of the significance thresholds. Therefore, emissions generated by the Project in the other air district jurisdictions would not result in a cumulatively considerable net increase in regional emissions. Construction, decommissioning, and site reclamation impacts associated with net increases in criteria pollutant emissions in other air district jurisdictions would therefore be **less than significant**.

TABLE 3.3-6
PROJECT PEAK DAILY CONSTRUCTION EMISSIONS WITHIN OTHER AIR DISTRICT JURISDICTIONS

Air District	Source	ROG	NO_x	PM_{10}	$PM_{2.5}$
TCAPCD	Vehicles	1	22	1	<1
	Significance Thresholds[1]	25	25	80	--
GCAPCD	Vehicles	1	16	<1	<1
	Significance Thresholds	--	--	--	--
CCAPCD	Vehicles	1	18	1	<1
	Significance Thresholds	--	--	--	--
YSAQMD	Vehicles	2	42	1	1
	Significance Thresholds[2]	-	-	80	--
SMAQMD	Vehicles	<1	8	<1	<1
	Significance Thresholds	-	85	80	82
SJVAPCD	Vehicles	<1	2	<1	<1
	Significance Thresholds[3]	-	-	-	-
Significant Impacts?		**No**	**No**	**No**	**No**

NOTES: GCAPMD and CCAPCD do not have posted adopted significance thresholds.

1 Represents Level A thresholds, same as those applicable to the AQMD.

2 YSAQMD significance thresholds for ROG and NO_x are 10 tons per year. On an annual basis, Project-related ROG and NO_x emissions that would be generated in the YSAQMD jurisdiction would be less than 1 ton per year and 2 tons per year, respectively, which would be less than significant.

3 SJVAPCD significance thresholds for ROG and NO_x are 10 tons per year and for PM_{10} and $PM_{2.5}$ are 15 tons per year. On an annual basis, Project-related ROG, NO_x, PM_{10}, and $PM_{2.5}$ emissions that would be generated in the SJVAPCD jurisdiction would be less than 0.1 ton per year, which would be less than significant.

SOURCES: YSAQMD, 2007; SMAQMD, 2015; SJVAPCD, 2015

Impact 3.3-3: Operation of the Project would generate pollutant emissions that would not result in a cumulatively considerable net increase of criteria pollutants, which the Project region is non-attainment of State ambient air quality standards. (*Less Than Significant Impact*)

Long-term operation and maintenance of the Project would result in air pollutant emissions from 24 daily 50-mile worker automobile trips, two cranes operating up to 4 hours per day and two mowers operating 4 hours per day for maintenance work, a propane heater at the O&M building, and periodic testing and maintenance of a 268 horsepower emergency generator for up to 2 hours per day and 100 hours per year. The worker automobile trip exhaust emissions were estimated using 2023 emissions factors obtained from the Emfac2017 model, and worker trip dust emissions from unpaved road travel and the crane and emergency generator emissions were estimated using the CalEEMod version 2013.3.2 model. CalEEMod is not able to estimate propane heater emissions, but those emissions would not be considerable. **Table 3.3-7** presents the estimated daily operation and maintenance emissions that would be associated with the Project (see Appendix B for the emission calculations).

TABLE 3.3-7
PROJECT PEAK DAILY OPERATION AND MAINTENANCE EMISSIONS

	Daily Operation and Maintenance Emissions (pounds)							
			PM_{10}			$PM_{2.5}$		
Project Component	**ROG**	**NO_x**	**Exh.**	**Dust**	**Total**	**Exh.**	**Dust**	**Total**
Worker Vehicle Emissions	0.14	0.23	0.12	54.48	54.60	0.03	5.58	5.63
Maintenance Work with Cranes and Mowers	0.53	5.51	0.27	0.00	0.27	0.25	0.00	0.25
Emergency Generator Testing and Maintenance	0.88	2.46	0.13	0.00	0.13	0.13	0.00	0.13
Total (pounds per day)	**1.55**	**8.19**	**0.52**	**54.48**	**55.00**	**0.43**	**5.58**	**6.01**
Level A Threshold (pounds per day)	25	25		--	80	--	--	--
Threshold Exceeded?	No	No	--	--	No	--	--	--

SOURCE: Appendix B

These operation and maintenance emissions would not exceed the AQMD Level A significance thresholds. Therefore, emissions generated by operation and maintenance the Project would not be expected to result in a cumulatively considerable net increase in pollutant emissions. Operation and maintenance impacts associated with the generation of criteria pollutant and precursor emissions would therefore be **less than significant**.

Project Contribution to Cumulative Health Effects

No single project by itself would be sufficient in size to result in regional non-attainment of ambient air quality standards. Instead, a project's individual emissions contribute to existing cumulative adverse air quality impacts, and while its emissions may be individually limited, it could be cumulatively considerable when taken in combination with past, present, and future development projects. The project-level thresholds for criteria air pollutants are based on levels at

which new sources are not anticipated to contribute to an air quality violation or result in a considerable net increase in criteria air pollutants. Therefore, if a project leads to a significant impact individually, the project would also be considered to contribute significantly to the cumulative impact.

A CEQA air quality analysis of criteria air pollutants is based on significance thresholds that were set at emission levels tied to the region's attainment status (SJVAPCD, 2014). The CEQA significance thresholds are emission levels above which stationary air pollutant sources permitted by the AQMD (typically, industrial facilities, refineries, and the like) must offset their emissions through purchase of emissions "offsets" from other facilities that have reduced emissions, either through installation of emissions controls or removal of an emissions source. Such offset levels allow for regional development while keeping the cumulative effects of new sources at a level that would not impede attainment of the NAAQS. Therefore, a CEQA air quality analysis of criteria air pollutants is essentially an analysis of regional, cumulative air quality impacts and a given project's contribution to those impacts.

The health effects that are associated with emissions of criteria pollutants are described in the *Criteria Air Pollutants* discussion in Section 3.3.1.2, *Environmental Setting*. As described in the *Criteria Air Pollutants* discussion in Section 3.3.1.3, *Regulatory Setting*, compliance with the ambient air quality standards indicates that regional air quality can be considered protective of public health. The ambient air quality standards are expressed in terms of the concentrations of individual pollutants within the air. With certain exceptions, given current air quality modeling tools, calculating an individual project's effect on ambient pollutant concentrations does not yield information that is accurate enough to be useful. In addition, for projects that produce emissions for two years or less, this analysis is not meaningful because quantities of emissions are too small to have a statistically significant effect on health outcomes. Exceptions include CO, which is directly emitted from tailpipes and the concentration of which can be calculated proximate to locations such as high-volume intersections, where CO concentrations are typically highest. However, CO emissions and concentrations have decreased dramatically in urban areas of California in the nearly 45 years since introduction of the catalytic converter. Accordingly, modeling of CO concentrations is seldom required. Another exception is fine particulate matter. Concentrations of $PM_{2.5}$ exhaust can be used as a proxy for diesel particulate matter in a health risk assessment, which is a separate type of air quality analysis from the criteria pollutants discussed herein (see Impact 3.3-4).

Ozone, however, is a regional pollutant for which project-specific concentration modeling is not reliable given current modeling limitations. Because of the complexity of ozone formation and the non-linear relationship of ozone concentration with its precursor gases, and given the state of environmental science modeling in use at this time, it is infeasible to convert specific mass emissions levels (i.e., weight) of NO_x or ROGs emitted in a particular area (or by a particular project) to a particular concentration of ozone in that area (SJVAPCD, 2014). Meteorology, the presence of sunlight, seasonal impacts, and other complex chemical factors all combine to determine the ultimate concentration and location of ozone (South Coast AQMD, 2014; SJVAPCD, 2014). Furthermore, available models are designed to determine regional, population-wide health impacts, from long-term emission sources and cannot accurately quantify ozone-

related health impacts caused by NO_x or ROG emissions from the local level, and in particular not at the level of an individual project's construction emissions that last for less than 2 years.

As a result, project-level mass (weight) emission thresholds have been established for ozone precursors (NO_x and ROG) and PM_{10} precisely because it is not possible to readily convert mass emissions at the project-level to regional pollutant concentrations. The AQMD's thresholds for ROG, NO_x, and PM_{10} are tied to the offset requirements for ozone precursors based on the fact that the Air Basin is not in attainment with the State ozone and PM_{10} standards and therefore such an approach is appropriate to identify potential to cause further deterioration of ambient air quality, which would be a regionally cumulative significant impact. As explained above, attainment can be considered protective of public health, thus providing a strong link between a mass emission threshold and avoidance of health effects. These thresholds provide a connection between a mass emission threshold and avoidance of health effects.

As discussed above, the Project would not exceed the project-level Level B significance thresholds for construction, decommissioning, or site reclamation ROG or NO_x emissions, with the implementation of mitigation (Tier 4 engines) to reduce the construction emissions impact of NO_x to less than significant, and the Project would not exceed the Level A significance thresholds for operations. Therefore, the contribution of the Project to the cumulative, regional air quality impacts related to ozone precursors would not be considerable, and the Project's contribution to any cumulative air quality impacts would not be significant. As explained above, because the significance thresholds are linked to the avoidance of health effects, the Project would not be anticipated to result in an adverse health effect with respect to emissions of ozone precursors.

With respect to construction emissions of PM_{10} and $PM_{2.5}$, the vast majority (i.e., 99 percent PM_{10} and 94 percent $PM_{2.5}$) of the emissions that would be generated by construction of the Project would be in the form of fugitive dust due to vehicle travel on unpaved surfaces and ground disturbing activities on the Project Site. The scientific evidence of health effects from particulate matter suggest that combustion-derived components of particulate matter are the strongest drivers for adverse health effects, and that particulate matter from combustion sources are the greatest contributors to particulate matter-related mortality (SMAQMD, 2020). $PM_{2.5}$ has a greater effect on health compared to PM_{10} because these particles are small enough to be able to penetrate to the deepest parts of the lungs.

Although Shasta County does not have mass significance thresholds for $PM_{2.5}$, Project construction emissions would exceed the Shasta County AQMD Level B significance threshold for PM_{10} even with implementation of mitigation, resulting in a significant cumulative impact to regional air quality, which may result in adverse health effects from particulate matter, such as aggravating asthma and bronchitis, on local sensitive receptors in the vicinity of the Project Site and haul routes.

A quantitative health impact assessment (HIA) has not been prepared because the results of an HIA would be unlikely to reasonably inform decision-makers or members of the public of any causal link between changes in ozone and $PM_{2.5}$ concentrations associated with the Project and any specific individual health impact. While recent studies suggest a correlation between $PM_{2.5}$

concentrations and human health effects, substantial scientific uncertainty remains regarding a clear link between cause and effect. In fact, no studies have validated direct cause and effect from relatively small changes in concentration in localized vicinities. Uncertainty stems from the limitations of epidemiological studies, including inadequate exposure estimates, difficulty in identifying root health cause and effect, and the inability to control for many factors (including lifestyle factors like smoking or exposures to other air pollutants) that could explain the association between $PM_{2.5}$ and adverse health impacts. Further, for both the $PM_{2.5}$ and ozone health effects calculated in an HIA, each of the pollutants may amplify the health impact of the others. Due to these uncertainties, there is a high likelihood that modeled health effects, identified in an HIA, would not be reliably predictive of the actual future health effects of the Project. Thus, while it would be possible to rely on modeling software like BenMAP-CE, AERMOD, and other models, to calculate potential outcomes, the County has not done so based on a determination that the results would not be reasonably informative about the impacts of Project emissions.

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c) Whether the Project would expose sensitive receptors to substantial pollutant concentrations.

Impact 3.3-4: Project activities would generate emissions of toxic air contaminants, potentially exposing sensitive receptors to harmful pollutant concentrations. (*Less Than Significant Impact*)

Diesel particulate matter (DPM) was identified as a TAC by CARB in 1998. DPM is only TAC that would be generated by the Project. Construction of the Project would result in temporary generation of DPM emissions during an up-to 21-month period (two years with no construction in January through March) caused by the use of off-road diesel equipment and from construction material and equipment deliveries and debris hauling using on-road heavy-duty trucks. Long-term sources of DPM emissions associated with the Project would be insignificant and limited to 12 worker vehicle trips per day, operation of two cranes and two mowers for maintenance activities up to 4 hours per day, and periodic testing of the emergency generator during an approximately 40-year period that would commence with issuance of the requested use permit.

The dose to which receptors are exposed is the primary factor affecting health risk from TACs. Dose is a function of the concentration of a substance or substances in the environment and the duration of exposure to the substance. According to the Office of Environmental Health Hazard Assessment (OEHHA), health risk assessments, which determine the exposure of sensitive receptors to TAC emissions, should be based on 9-, 30-, and/or 70-year exposure periods when assessing TACs (such as DPM) that have only cancer or chronic non-cancer health effects. However, such health risk assessments should be limited to the duration of the emission-producing activities associated with the project, unless the activities occur for less than six months. Activities that would last more than 2 months, but less than 6 months, are recommended to be evaluated as if they would last for 6 months. The OEHHA does not recommend assessing cancer risk for projects lasting less than 2 months at the maximum exposed individual resident (MEIR) (OEHHA, 2015). In addition, the AQMD approval of permits requires certain evaluation and notification requirements for facilities that would have the potential to emit hazardous air pollutants that would be located

within 1,000 feet of a school (AQMD, 2003b). There are no schools in the vicinity of the Project Site; however, this distance is used here as a screening threshold for nearby residences as to whether a quantitative health risk assessment should be prepared for the Project.

The Project would take up to 21 months to construct. However, the closest residence to any of the work areas on the Project Site are off Sycamore Road, approximately 1,900 feet to a Project Site construction staging area. The closest residence to any of the access roads on the Project Site are along Moose Avenue, at distances as close as approximately 400 feet. It is anticipated that any construction improvements to this section of the access road would take less than 2 months to complete and the associated health risk impact of those improvements would not be adverse because the duration of DPM exposure would be low. Therefore, the health risk from the short-term DPM emissions that would be associated with construction, decommissioning, and site reclamation of the Project would be expected to result in a maximum cancer risk at the nearest residences that would not exceed the maximum individual cancer risk threshold of 10 in one million. This represents a less-than-significant impact relative to exposure of sensitive receptors to substantial pollutant concentrations.

Mitigation: None required.

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d) Whether the Project would result in other emissions (such as those leading to odors) adversely affecting a substantial number of people.

Impact 3.3-5: Project construction, decommissioning, site reclamation, and operation would not create objectionable odors adversely affecting a substantial number of people. (*Less than Significant Impact*)

Project construction, decommissioning, and site reclamation activities would include sources, such as diesel equipment, which could result in the creation of objectionable odors. These activities would be temporary or periodic, and spatially dispersed, and any associated odors would dissipate quickly from the sources. Further, 50 cabin residences are used year-round in the private recreational facility of Moose Camp. Estimating the population of Moose Camp based on the average household size in nearby Burney (i.e., 2.45 people per household as reported by City Data [2020]), any Project odors could impact no more than 123 people. Given relative distances between odor-causing Project elements and the cabins (i.e., as close as approximately 400 feet to Moose Avenue, which would be used as an access route for the Project) and the more than 180,000 people who live in Shasta County (U.S. Census Bureau, 2019), this is a conservative estimate of the potentially affected population. Accordingly, these activities would not affect a substantial number of people that reside in Shasta County. Additionally, odor emissions would be episodic and short-term. Therefore, impacts from odors generated by construction, decommissioning, and site reclamation of the Project would be less than significant.

Mitigation: None required.

3.3.3.3 PG&E Interconnection Infrastructure

As noted in Section 2.4.3, *Project Substation, Switching Station, and Interconnection Facilities*, minor modifications or upgrades to the existing 230 kV line may be required to facilitate the Project's interconnection. Upgrades to PG&E facilities are anticipated to include construction and/or reconfiguration of utility line structures and transmission line circuits involving four to six new transmission poles. If required, these new poles would be located adjacent to the proposed substation and switching station. Daily construction emissions that would be associated with these improvements are expected to occur during the second year of construction and are not anticipated to contribute to the peak daily construction emissions that year since the power line connection phase of the Project is expected to be constructed subsequent to the peak construction period. For emission estimates associated with off-road equipment use, helicopter use, and vehicle trips related to these improvements, refer to the "transmission line connection" emissions described in Appendix B. Operation of the power line connection would not result in the generation of emissions and maintenance of the power line connection would result in negligible emissions associated with periodic inspections. In and of themselves, these improvements would result in less than significant impacts to air quality.

3.3.3.4 Direct and Indirect Effects of Alternatives

Alternative 1: South of SR 299

Alternative 1 would implement the Project exclusively in that portion of the Project Site located south of SR 299; none of the up to seven turbines proposed to the north of SR 299 (turbine numbers A01 through A07) or related infrastructure would be developed. Under Alternative 1, construction activities, including timber harvesting, would generate fewer vehicle trip and equipment emissions than the number estimated for the Project because up to seven fewer turbines and their related infrastructure would not be constructed. Similarly, the decommissioning and site reclamation phase would also generate fewer vehicle trip and equipment emissions than the amounts estimated for the Project, as the number of turbines and their related infrastructure to be developed and size of the area to be reclaimed would be less than what was identified for the Project. However, due to the high levels of peak emissions that would be associated with the Project disclosed in Table 3.3-4, the construction, decommissioning, and site reclamation emissions that would be associated with Alternative 1 also would result in a significant air quality impact with implementation of Mitigation Measures 3.3-1a through 3.3-1b. Operation of Alternative 1 would result in the same less-than-significant air quality impacts as identified for the Project because no reduction in employee trips to or from the Project Site, crane and mower use, propane heater use, or emergency generator testing are anticipated. In sum, although the impacts of Alternative 1 to air quality would be slightly reduced relative to the Project, the impact conclusions would be the same as identified for the Project.

Alternative 2: Increased Setbacks

Under Alternative 2, proposed setbacks would be increased relative to the Project to preclude turbine construction within three times the height of the turbine (i.e., within 2,037 feet) of a residential property line and within 1.5 times the height of the turbine (i.e., within 1,018.5 feet) of State Route 299, any other publicly-maintained public highway or street, and of Supan Road or

Terry Mill Road. Under Alternative 2, construction activities, including timber harvesting, would generate fewer vehicle trip and equipment emissions than the number estimated for the Project because up to four fewer turbines and their related infrastructure would not be constructed. Similarly, the decommissioning and site reclamation phase would also generate fewer vehicle trip and equipment emissions than the amounts estimated for the Project, as the number of turbines and their related infrastructure to be developed and size of the area to be reclaimed would be less than what was identified for the Project. However, due to the high levels of peak emissions that would be associated with the Project disclosed in Table 3.3-4, the construction, decommissioning, and site reclamation emissions that would be associated with Alternative 2 would also result in a significant air quality impact with implementation of Mitigation Measures 3.3-1a and 3.3-1b. Operation of Alternative 2 would result in the same less-than-significant air quality impacts as identified for the Project because no reduction in employee trips to or from the Project Site, crane and mower use, propane heater use, or emergency generator testing are anticipated. In sum, the impacts of Alternative 2 on air quality would be slightly less than the Project, but the impact conclusions would be the same.

No Project Alternative

If the No Project Alternative is implemented, none of the proposed wind project infrastructure would be delivered to the Project Site or constructed, operated and maintained, or decommissioned there. No construction, equipment, or additional vehicle trips would be made to, from, or within the site relative to baseline conditions. Ground clearance would not occur for laydown areas; utility line rights-of-way; roads; or the collector substation, switching station, or O&M facility. The Project Site would continue to be operated as managed forest timberlands. Because there would be no change relative to baseline conditions, the No Project Alternative would create no impact related to air quality.

The Project Site is zoned for timber production. Pursuant to regulations implementing the California Timberland Productivity Act (Government Code §51100 et seq.; 14 Cal. Code Regs. §897[a]), there is a legal presumption that "timber harvesting is expected to and will occur on such lands." The regulations further specify that timber harvesting on such lands "shall not be presumed to have a Significant Adverse Impact on the Environment" (14 Cal. Code Regs. §898). Therefore, the No Project Alternative, including anticipated timber harvesting, is not presumed to result in a significant adverse individual or cumulative effect. CAL FIRE would review any future timber harvesting proposal to evaluate any potential project-specific, site-specific environmental impacts, including to air quality.

3.3.4 Cumulative Analysis

The geographic scope considered for cumulative impacts to air quality is the Sacramento Valley Air Basin and San Joaquin Valley Air Basin.

In developing mass emissions thresholds of significance for criteria air pollutants and ozone precursors, air districts consider the emission levels for which a project's individual emissions

would be cumulatively considerable. Therefore, if a project would exceed the identified construction or operational significance thresholds, its emissions would be cumulatively considerable, and if a project would not exceed the construction or operational significance thresholds, its emissions would not be cumulatively considerable.

The region is non-attainment of ozone and PM_{10} ambient air quality standards; which indicates an existing significant cumulative impact exists. As described in Section 3.3.3.2 (see Impacts 3.3-1, 3.3-1b), implementation of Mitigation Measures 3.3-1a and 3.3-1b would reduce significant ozone impacts of Project-related construction, decommissioning, and site reclamation activities to less than significant; however, implementation of Mitigation Measures 3.3-1a, 3.3-1b, and 3.3-2c would not reduce the significant PM_{10} impacts from construction, decommissioning, and site reclamation activities to a less-than-significant level. Therefore, construction of the Project would result in a cumulatively considerable net increase in PM_{10} and NO_x emissions pre-mitigation, and a cumulatively considerable net increase in PM_{10} emissions post-mitigation, the associated cumulative impact would be significant and unavoidable. All other criteria pollutant emissions, including those that would be generated within the SJVAB (see Impact 3.3.-2d), would be less than the respective significance thresholds and therefore would not be cumulatively considerable and would result in less-than-significant cumulative impacts.

With regard to impacts on sensitive receptors, the total DPM emissions from Project on-site construction equipment that would occur at the Project Site would result in less-than-significant impacts, and would not combine with emissions from other cumulative projects to the extent that a significant cumulative impact would occur because, as identified on Section 3.1.2.1, *Cumulative Scenario*, there are no cumulative projects close enough to the Project Site to interact with those of the Project. The cumulative impact that would be associated with construction, decommissioning, site reclamation, and operation of the Project would be less than significant.

Odor impacts that would be associated with the Project would be limited to combustion of diesel fuels. The impact would be less than significant because construction, decommissioning, and site reclamation activities would be intermittent and spatially dispersed, associated odors would dissipate quickly, and because the number of potentially affected people would be small. There is no existing adverse cumulative condition related to odors to which the Project could contribute. Given the proximity of cumulative projects to the Project Site and the expected duration of sensitive receptor exposure to Project-related diesel fumes, projects in the cumulative scenario would not cause diesel-related odors that would intermingle with those of the Project and, thereby, cause a significant cumulative effect. The cumulative impact would be less than significant.

Long-term operation and maintenance of the Project would not cause emissions that would exceed the operational significance thresholds (see Impact 3.3-3). Therefore, the cumulative impact would be less than significant.

The cumulative impacts of the alternatives would be substantially similar to those of the Project.

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3.4 Biological Resources

This section identifies and evaluates issues related to vegetation, wildlife and other Biological Resources in the context of the Project and alternatives. It includes information about the physical and regulatory setting and identifies the criteria used to evaluate the significance of potential impacts, the methods used in evaluating these impacts, and the results of the impact assessment. The information and analysis presented in this section are based in part on the following site-specific or species-specific technical reports. A copy of each is provided in **Appendix C**, *Biological Resources*.

1. Appendix C1: Western EcoSystems Technology (WEST), Inc., 2017. Site Characterization Study Report, Fountain Wind Project, Shasta County, California. January.
2. Appendix C2: Stantec, 2019. Fountain Wind Energy Project Aquatic Resources Survey Report. December 23.
3. Appendix C3:
    a. WEST Inc., 2018. Rare Plant Surveys and Natural Vegetation Community Mapping. Fountain Wind Project, Shasta County, CA. October 17.
    b. WEST, Inc., 2019. Rare Plant Surveys and Natural Vegetation Community Mapping. Fountain Wind Project, Shasta County, California. December 20.
4. Appendix C4:
    a. WEST, Inc., 2018. Year 1 Avian Use Study Report and Risk Assessment for the Fountain Wind Project, Shasta County, California. November 5.
    b. WEST, Inc., 2019. Results of the Year 2 Avian Use Study at the Fountain Wind Project – Addendum to the Year 1 Avian Use Study Report and Risk Assessment. Memorandum to ConnectGen Operating LLC. September 5.
5. Appendix C5: WEST, Inc., 2018. Great Gray Owl Habitat Assessment, Fountain Wind Project, CA. Memorandum to Pacific Wind Development. October 24.
6. Appendix C6: WEST, Inc., 2018. Bat Acoustic Survey Report, Fountain Wind Project, Shasta County, CA. October 22.
7. Appendix C7: WEST, Inc., 2018. 2017 Raptor Nest Survey Report for the Fountain Wind Project, California. Memorandum to Pacific Wind Development. September 19.
8. Appendix C8: WEST, Inc., 2018. 2018 Northern Goshawk Nest Survey Results, Fountain Wind Project, CA. Memorandum to Pacific Wind Development. October 15.
9. Appendix C9: WEST, Inc., 2018. 2018 Eagle Nest Status Survey Report, Fountain Wind Project, California. Memorandum to Pacific Wind Development. September 19.
10. Appendix C10: WEST, Inc., 2018. Response to Informal Consultation Request for Use Permit 16-007, Fountain Wind Project, Shasta County. November 6.
11. Appendix C11: WEST, Inc., 2020. California Spotted Owl Risk Assessment for the Proposed Fountain Wind Project, Shasta County, California. February 24.

12. Appendix C12: WEST, Inc., 2018. 2018 Willow Flycatcher Survey Results, Fountain Wind Project, CA. Memorandum to Pacific Wind Development. October 17.

13. Appendix C13:

    a. WEST, Inc. 2019. 2018/2019 Foothill Yellow-legged Frog Assessment for the Fountain Wind Project, Shasta County, California. December 20.

    b. WEST, Inc., 2018. 2018 Foothill yellow-legged frog and Cascades frog habitat assessments and surveys, Fountain Wind Project, CA. Memorandum to Pacific Wind Development. October 22.

The County independently reviewed these and other materials prepared by or on behalf of the Applicant and determined them to be suitable for reliance on (in combination with other materials included in the formal record) in the preparation of this Draft EIR.

The California Department of Fish and Wildlife (CDFW), consistent with its role as a Responsible Agency, provided initial input for the County's environmental review process shortly after the CUP application was filed for the Project (CDFW, 2018). The Central Valley Regional Water Quality Control Board (RWQCB) also provided input consistent with its role as a Responsible Agency (RWQCB, 2018). Later, in response to the issuance of notice of intention to prepare this Draft EIR, the County received scoping input about all manner of flora and fauna from a variety of sources. All scoping input received, including regarding Biological Resources, is provided in Section 4.1 of the Scoping Report (Environmental Science Associates, 2019).

3.4.1 Setting

3.4.1.1 Study Area

For the purpose of this analysis of impacts on Biological Resources, the study area consists of the 4,464-acre Project Site. The Project Site is within an approximately 29,500-acre leasehold area (Leasehold Area) in Shasta County in northern California west of the community of Burney and northeast of the larger community of Redding (Figure 2-1, *Project Location*). The east-west running California State Route 299 (SR 299) bisects the northern portion of the Project Site. The Hatchet Ridge Wind Project, which has been in operation since 2010, is located approximately 1 mile to the east. Lassen National Forest is located to the southeast of the Project and Shasta-Trinity National Forest is located to the north and east.

3.4.1.2 Environmental Setting

Regional Ecology

The Project Site is located within the Cascades Ecological Region (ecoregion; Griffith et al. 2016), which is a Level III ecoregion primarily covering parts of Oregon and Washington but also including a discontinuous land area near Mt. Shasta in California. This ecoregion is characterized by underlying volcanic rock strata and a physiography defined by recurring periods of glaciation. With high plateaus and valleys that trend east, this ecoregion includes steep ridges as well as both

active and dormant volcanoes, and is marked by a generally mesic, temperate climate which supports productive coniferous forests and at higher elevations, subalpine meadows.

Leasehold Area Ecology

Topography within the study area is characterized by gently rolling hills that transition to relatively steep, low mountains, with elevations ranging from approximately 2,156 feet; 657 meters in the southwestern corner of the Leasehold Area to 6,814 feet (2,077 meters) near Snow Mountain in the southeast corner. Significant waterways within the Leasehold Area include the north and south forks of Montgomery Creek. The dominant vegetation community is Sierran mixed conifer forest; however, the structure and species composition of this community varies greatly with slope, aspect, elevation, and disturbance (e.g., fire and forest management). Dominant overstory species include a combination of white fir (*Abies concolor*), Douglas fir (*Pseudotsuga menziesii*), incense cedar (*Calocedrus decurrens*), ponderosa pine (*Pinus ponderosa*), sugar pine (*P. lambertiana*), and California black oak (*Quercus kelloggii*).

The Leasehold Area drains to the north and west into the Pit River and Sacramento River watersheds. A number of permanent and intermittent streams run throughout the Leasehold Area, flowing primarily to the west and northwest. The primary drainages in the north are Hatchet Creek and Montgomery Creek (north and south forks), while Cedar Creek and Little Cow Creek drain the southern portions of the Leasehold Area. Riparian vegetation along these creeks includes various willow species (*Salix* spp.), thinleaf alder (*Alnus incana* ssp. *tenuifolia*), several species of maple (*Acer* spp.), mountain dogwood (*Cornus nuttallii*), and California hazel (*Corylus cornata* var. *californica*). Soils within the Leasehold Area are primarily composed of the Cohasset, Windy, McCarthy and Lyonsville-Jiggs series and range from stony to clay loams that have formed in residuum weathered from volcanic rock (USDA Natural Resources Conservation Service [NRCS], 2017).

The Leasehold Area consists exclusively of private property operated as managed forest timberlands. In August 1992, the Fountain Fire burned approximately 64,000 acres (100 square miles) in and around the Leasehold Area, including a portion of the Project Site. Post-fire management included salvage logging, site preparation, and planting in the year following the fire. Within 5 years of the fire, approximately 17 million seedlings were planted in areas previously supporting timber. Species planted included ponderosa pine, Douglas-fir, and white fir at 10-foot (3.0-meter) spacing, with incense cedar planted along stream buffers. To reduce competition for (tree) seedling establishment, growth regulator herbicides were applied in many areas that had been colonized by manzanita (*Arctostaphylos* spp.) and California-lilac (*Ceanothus* spp.; Appendix C1).

Vegetation Communities

In spring and summer of 2018 and 2019 Western Ecosystems Technology, Inc. (WEST) botanists conducted vegetation mapping and rare plant surveys within the Project Site, covering 4,373.1 acres (Appendix C3a, Appendix C3b). Eight vegetation communities were categorized to the alliance level, consistent with *A Manual of California Vegetation, 2nd Edition* (MCV) (Sawyer et al., 2009) and updated in the current online edition (CNPS, 2019). Eight natural vegetation

communities present within the Project Site are summarized in **Table 3.4-1**, *Natural Vegetation Communities Present and Area within Project Site and Alternatives* and shown on **Figure 3.4-1**.

TABLE 3.4-1
NATURAL VEGETATION COMMUNITIES PRESENT AND AREA WITHIN PROJECT SITE AND ALTERNATIVES

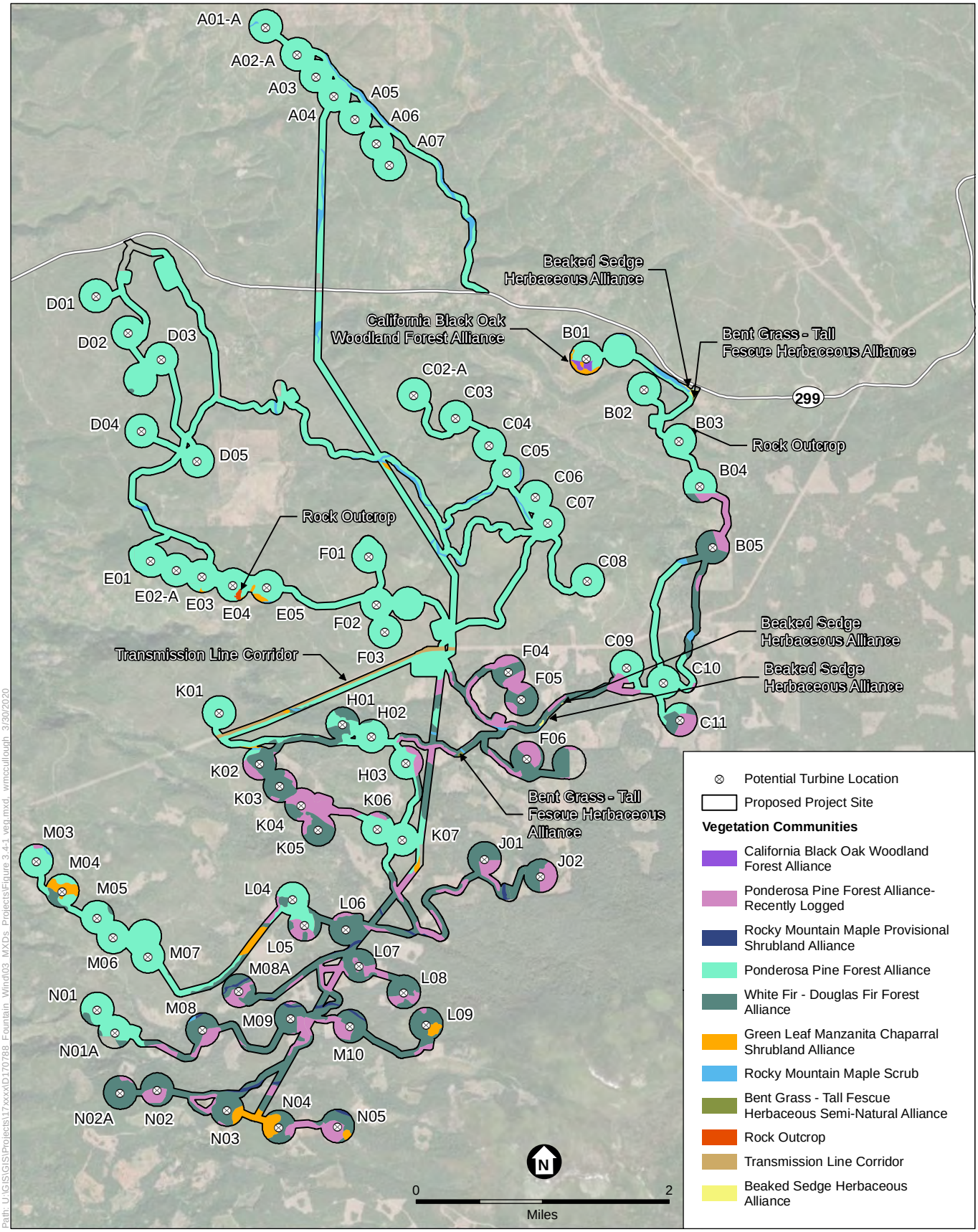
Vegetation Communities (*Scientific Name*)	State and Global Rarity Rank[1]	Project Site[2]	Alternative 1	Alternative 2
Upland				
Ponderosa Pine Forest (*Pinus ponderosa* Forest Alliance [FA])	G5/S4	2,668.8	2325.9	2568.2
Ponderosa Pine Forest – Recently Logged (*Pinus ponderosa* FA)	S4	485.4	485.4	475.4
White Fir - Douglas Fir Mixed Forest (*Abies concolor - Pseudotsuga menziesii* FA)	S4	1,028.5	1028.5	1016.1
California Black Oak Woodland (*Quercus kelloggii* FA)	S4	5.5	5.5	0.0
Green Leaf Manzanita Chaparral (*Arctostaphylos patula* Shrubland Alliance)	S4	76.2	76.2	69.2
Bent Grass - Tall Fescue Meadow (*Agrostis* [*gigantea, stolonifera*] - *Festuca arundinacea* Herbaceous Semi-Natural Alliance)	SNA	1.4	1.4	1.4
Riparian				
Rocky Mountain Maple Riparian Scrub (*Acer glabrum* Provisional Shrubland Alliance)[2]	S3?	107.2	76.0	105.6
Wetland				
Beaked Sedge Wet Meadow (*Carex utriculata* Herbaceous Alliance)	S4	3.4	3.4	3.4
Total		**4,373.1**	**4,002.3**	**4,239.3**

NOTES:

1 State Rank (CDFW 2019):
S3? Apparently Vulnerable – A question mark (?) denotes an inexact numeric rank because we know we have insufficient samples over the full expected range of the type, but existing information points to this rank (Sawyer et al. 2009).
S4 Apparently Secure – Uncommon but not rare; some cause for long-term concern due to declines or other factors.
SNA – Semi-Natural Alliance, not ranked because dominant species not all native.

2 The survey area (4,373.1 acres) was slightly different from the Project Site (4,464 acres) as surveys were performed prior to minor changes to the project layout; therefore, approximately 800 acres of the Project Site were not included in the 2019 Rare Plants Survey Area. If these areas were included in the final project footprint, pre-construction surveys will be performed (C-3; WEST 2019b).

SOURCE: WEST, 2019.



SOURCE: WEST Rare Plant & Natural Vegetation Communities Report; 2018/2019

Fountain Wind Project

Figure 3.4-1
Natural Vegetation Communities Found within the Project Site

Descriptions of the eight natural vegetation communities are presented below with the Forest Alliance (FA) name first followed by the more general (habitat description).

Ponderosa Pine Forest FA (Mixed Conifer Forest Burned)

The dominant vegetation community in the Project Site, the Ponderosa Pine FA, burned in the 1992 Fountain Fire. The area was subsequently replanted with conifer seedlings of ponderosa pine (*Pinus ponderosa*), Douglas fir (*Pseudotsuga menziesii*) and white fir (*Abies concolor*). Ponderosa pine is the dominant overstory species in the mixed conifer forest of even-aged trees (approximately 25 years old). Understory shrub and herbaceous vegetation is variable in species composition and cover, with mahala mat (*Ceanothus prostratus*), green leaf manzanita (*Arctostaphylos patula*), bracken fern (*Pteridium aquilinum*), and native squirrel tail grass (*Elymus elymoides*) most common.

Ponderosa Pine Forest FA – Recently Logged (Logged/Recently Logged)

This Ponderosa Pine FA has been logged within the past 10 to 15 years, through commercial timber harvest, with planted conifer saplings and seedlings, and small, remnant patches of mature trees. Ponderosa pine, and white fir less commonly, are the planted seedling species (Appendix C3). Understory in this FA is sparse, but dominated by invasive herbaceous species where present, including mullein (*Verbascum thapsus*), bull thistle (*Cirsium vulgare*), common St. Johnswort (*Hypericum perforatum*), and houndstongue (*Cynoglossum officinale*).

White Fir – Douglas Fir Forest FA (Mixed Conifer Forest – Burned)

The White Fir – Douglas Fir FA was found in a mosaic with the logged/recently logged areas and those areas not burned by the Fountain Fire (Appendix C3). The forest contains mature, even-aged, mixed conifer species, including white fir, Douglas fir, sugar pine (*Pinus lambertiana*), ponderosa pine, incense cedar (*Calocedrus decurrens*) and red fir (*Abies magnifica*). Forest openings often contain California black oak (*Quercus kelloggii*) and sparse understory due to a closed tree canopy.

California Black Oak Woodland FA (Black Oak Woodland)

The California black oak woodland was found in previously burned areas and lower elevations of the Project Site in a mosaic with patches of green leaf manzanita chaparral (Appendix C3). The deciduous California black oak trees have an open canopy and well-established understory of green leaf manzanita and grasses with Lemmon's needlegrass (*Stipa lemmonii*) most common.

Rocky Mountain Maple Provisional Shrubland Alliance (SA) (Mixed Montane Riparian Scrub/Mixed Montane Riparian Forest)

The Rocky Mountain Maple Provisional SA is a riparian vegetation community, located along ephemeral, intermittent and perennial streams and drainages throughout the Project Site. Rocky Mountain maple is the dominant species, with gray alder (*Alnus incana*) often codominant, particularly in the southern portion of the Project Site and is Mixed Montane Riparian Forest habitat. Understory vegetation is variable in the Project Site, with the southern area generally wetter, with blackfruit dogwood (*Cornus sessilis*), twinleaf honeysuckle (*Lonicera involucrata*), vine maple (*Acer circinatum*), and adjacent conifers providing canopy cover. In the northern, more xeric, riparian areas, riparian understory is dominated by Scouler's willow (*Salix*

scouleriana) along streambanks, with green leaf manzanita and ceanothus (*Ceanothus* spp.) in drier areas. These drier riparian areas in the north of the Project Site are considered Mixed Montane Riparian Scrub habitat.

Green Leaf Manzanita Chaparral SA (Mixed Montane Chaparral)

Green Manzanita Chaparral SA was found interspersed with most other vegetation communities in the Project Site, including rocky ridges and slopes, forest openings, recently burned and recently logged areas, as well as a transmission corridor where vegetation is managed (Appendix C3). The chaparral habitat contains dense green leaf manzanita with bush chinquapin (*Chrysolepis sempervirens*), mountain whitethorn (*Ceanothus cordulatus*), and deerbrush (*Ceanothus integerrimus*) as co-dominants, with little herbaceous understory.

Beaked Sedge Meadows Herbaceous Alliance (HA) (Wet Montane Meadow)

Beaked Sedge Meadows HA were mapped within seasonally or permanently saturated emergent wetland areas adjacent to streams and ponds in higher elevation areas of the Project Site. Composition of these wet meadows is dominated by a high diversity of grass, sedge, rush and forb species, which include beaked sedge (*Carex utriculata*), bluejoint reedgrass (*Calamagrostis canadensis*), marsh foxtail (*Alopecurus geniculatus*), Nebraska sedge (*Carex nebrascensis*), brown sedge (*Carex subfusca*), sword leaved rush *(Juncus ensifolius*), and others. Scattered shrubs occur in some of these wet meadows.

Bentgrass – Tall Fescue Herbaceous Semi-Natural Alliance (Montane Meadow)

The Bentgrass – Tall Fescue Herbaceous Semi-Natural Alliance meadows are found in forest openings and sometimes adjacent to beaked sedge wet meadows. As a semi-natural alliance, these montane meadows are non-native species dominant. Dominant plants include non-natives creeping bentgrass (*Agrostis stolonifera*), tall fescue (*Festuca arundinacea*), and the native species common yarrow (*Achillea millefolium*), and goldenrod (*Solidago* sp.).

Sensitive Vegetation Communities

CDFW designates vegetation communities as sensitive that have a State Rank of S1 to S3. The Rocky Mountain Maple (*Acer glabrum*) Provisional Shrubland Alliance has a State Rank of S3? (Table 3.4-1). A State Rank with a question mark (?), denotes an inexact rank due to insufficient data samples (CDFW, 2020). Within the Project Site, the Rocky Mountain Maple Provisional Shrubland Alliance covers 107.2 acres or 2.4 percent of the Project Site (Table 3.4-1), and is found in riparian areas along ephemeral, intermittent and perennial stream drainages (Appendix C3). Riparian communities, including the Rocky Mountain Maple Provisional Shrubland Alliance, are also considered sensitive, regardless of State Rank, under CEQA because of their rarity and biological importance.

Aquatic Resources

Stantec Consulting Services Inc. (Stantec) conducted a delineation of potential WOTUS, including wetlands and riparian areas (Appendix C2; Stantec, 2019) This survey was completed at the Project Site in 2019 by Stantec biologists. The survey focused on classifying aquatic habitats following *A*

Guide to Wildlife Habitats of California, an older and more general classification system (Mayer and Laudenslayer, 1988) during the aquatic resources delineation (Appendix C2). The WOTUS survey area encompassed a total of 6,118.06 acres. The WOTUS survey covered a 700-foot radius centered on proposed turbine locations, a 200- to 400-foot corridor centered on project roads, a 300-foot corridor centered on the electrical collection line, a 200-foot buffer around proposed project facilities, and a 100-foot buffer around proposed construction staging areas.

The survey area for the WOTUS survey includes numerous named and unnamed drainages with some evidence of surface waters. These drainages include tributary basins of the Whitmore and Pit Rivers, which contain but are not limited to: Richardson Creek, Little Hatchet Creek, Hatchet Creek, Carberry Creek, Goat Creek, North Fork Montgomery Creek, Indian Spring, South Fork Montgomery Creek, Cedar Creek, North Fork Little Cow Creek, Little Cow Creek, and Mill Creek. Hydrology for these features is provided by sheet flow, snow melt, seeps, springs, and groundwater.

Stantec personnel identified 206 wetlands and classified them as one of six "wetland types." A total of 52 acres of potential waters of the United States were mapped within the WOTUS survey area and include fresh emergent wetland (1.0 acre), riparian wetland (26.8 acres), seasonal wetland (0.1 acre), vegetated ditch (0.2 acre), wetland meadow (8.7 acres), wetland seep/spring (1.8 acres), ephemeral stream (0.6 acre), intermittent stream (2.9 acres), non-vegetated ditch (0.2 acres), perennial stream (9.5 acres), and pond (0.2 acre) (Appendix C2). The Project Site boundary was overlain onto the WOTUS survey results to identify the wetlands occurring within the Project Site. Results are presented in **Table 3.4-2**, *Summary of Potentially Jurisdictional Aquatic Resources occurring within the Project Site*). These acreages and linear feet represent all the aquatic resources in the Project Site (Appendix C2).

Non-native Invasive/Noxious Weeds

Surveys for non-native invasive plant species were conducted concurrently with rare plant surveys conducted in 2018 and 2019 (Appendices C3, C4). Roadsides within the Project Site and a subsample of recently logged areas were the focus of the invasive plant surveys, with road segments mapped where invasive plant species were found and the abundance of each invasive species noted. All invasive plant species designated by the California Invasive Plant Council (CAL-IPC) as High, Moderate or Limited were mapped.

The most common invasive, non-native plants observed on the Project Site were common mullein (*Verbascum thapsus*), bull thistle (*Cirsium vulgare*), common St. Johnswort (*Hypericum perforatum*), and houndstongue (*Cynoglossum officinale*). These four invasive plant species were common throughout roadsides, logged and recently logged lands and are abundant in the managed forest lands surrounding the Project Site. Four invasive plant species observed in the Project Site that ranked "high" by CAL-IPC, include Himalayan blackberry (*Rubus armeniacus*), yellow starthistle (*Centaurea solstitialis*), medusahead rye (*Elymus caput-medusae*) and cheatgrass (*Bromus tectorum*). A total of fifteen species of noxious weeds were documented in the Project Site (Appendix C3a, C3b). As noted above, the Project Site and surrounding area are operated as managed forest timberlands, which creates regular disturbances and traffic from timber harvest, resulting in widespread establishment of invasive plants. Active management of some invasive species is performed on logged sites to reduce competition for conifer seedling establishment.

TABLE 3.4-2
SUMMARY OF POTENTIALLY JURISDICTIONAL AQUATIC RESOURCES OCCURRING WITHIN THE PROJECT SITE

Feature Type	Acres	Linear Feet	Cowardin Code[1]
Wetlands			
Fresh Emergent Wetland	0.08	211[2]	PEM
Riparian Wetland	22.10	N/A	PSS, PFO
Seasonal Wetland	0.11	N/A	PEM
Vegetated Ditch	0.01	142	PEM
Wetland Meadow	3.89	N/A	PEM, PSS, PFO
Wetland Seep/Spring	1.16	N/A	PEM, PSS
Subtotal – Wetlands	***27.35***	***353***	-
Other Waters			
Ephemeral Stream	0.40	6,946	R4SB
Intermittent Stream	2.28	6,008	R4SB
Non-vegetated Ditch	0.17	3,535	R4
Perennial Stream	7.72	26,550	R3UB
Pond	0.04	N/A	PUB
Subtotal – Other Waters	***10.61***	***43,039***	-
Total Jurisdictional Area	**37.96**	**43,392**	-

NOTES:

1 PEM = palustrine emergent, PSS = palustrine scrub-shrub, PFO = palustrine forested, R4SB = riverine intermittent streambed, R4 = Riverine intermittent, R3UB = riverine upper perennial unconsolidated bottom, PUB = palustrine unconsolidated bottom. Codes based on Cowardin et al. 1979.

2 Linear distance for stream segments mapped as fresh emergent wetlands.

SOURCE: Stantec, 2019.

Wildlife

The Aquatic Resource Survey (Appendix C2) mapped 109 perennial stream segments within the study area, a total of approximately 7.7 acres and 26,500 linear feet within the Project Site. The widths of these perennial streams vary between 2 and 90 feet (Appendix C2). In addition to native fishes such as the Sacramento pikeminnow (*Ptychocheilus grandis*) and the special-status Pit roach, the streams may contain invasive species such as green sunfish (*Lepomis cyanellus*) and spotted bass (*Micropterus punctulatus*). **Table 3.4-3** identifies special-status species from the region and their potential to occur within the Project Site.

Amphibians may be present in wetland and stream areas of the Project Site, and in moist leaf litter of the forested areas. In addition to amphibians listed in Table 3.4-3, other common amphibians that may be present include ensatina (*Ensatina eschscholtzii*), rough-skinned newt (*Taricha granulose*), western toad (*Anaxyrus boreas*), Pacific tree frog (*Pseudacris regilla*), and bullfrog (*Lithobates catesbeianus*).

TABLE 3.4-3
SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR WITHIN THE PROJECT SITE

Species	Status	Habitat	Potential for Occurrence in the Project Site
Invertebrates			
Conservancy fairy shrimp *Branchinecta conservatio*	FE/--	Turbid, slightly alkaline, large, deep, vernal pools and winter lakes in California grassland areas	**None**. Suitable vernal pool habitat absent within Project Site
Shasta crayfish *Pacifastacus fortis*	FE/SE	Cool, spring-fed headwaters with clean, volcanic cobbles, over sand and gravel substrates	**Low.** Known only from the Fall River and Hat Creek subdrainages of the Pit River system
Valley elderberry longhorn beetle *Desmocerus californicus dimorphus*	FT/--	Occurs only in the Central Valley of California, in association with blue elderberry (*Sambucus mexicana*)	**Low.** Known only to occur in locations west and south of Project Site in California's Central Valley
Vernal pool fairy shrimp *Branchinecta lynchi*	FT/--	Small, clear-water depression pools and grassed swales; endemic to grasslands of the Central Valley, central coast mountains, and south coast mountains	**None.** Known only from isolated locations in lower elevations of Shasta County; suitable vernal pool habitat absent from Project Site
Vernal pool tadpole shrimp *Lepidurus packardi*	FE/--	Vernal pools and swales in the Sacramento Valley containing clear to highly turbid water	**None.** Known only from isolated locations in lower elevations of Shasta County; suitable vernal pool habitat absent from Project Site
Fish			
Bull trout *Salvelinus confluentus*	FT/SE	Deep pools in cold rivers and large tributary streams, often in moderate to fast currents; also large coldwater lakes and reservoirs; historically found only in the McCloud River system	**None**. No suitable stream habitat present within Project Site; believed to be extinct in California
Chinook salmon *Oncorhynchus tshawytscha*	FT/ST (spring run) FE/SE (winter run)	Large freshwater streams and rivers and estuaries for spawning; require deep, cold, flowing water	**None**. No suitable stream habitat present within Project Site
Pit roach *Lavinia symmetricus mitrulus*	--/SSC	Inhabit deep pools and areas of low flow, moderate gradients, warm temperatures, and mats of vegetation.	**Low.** Limited suitable habitat present on the Project Site; one record of this species 2.7 miles north on Pit River.
Steelhead (Central Valley DPS) *Oncorhynchus mykiss irideus*	FT/--	Sacramento and San Joaquin rivers and their tributaries	**None**. Range lies to the west and south of the Project Site; no suitable stream habitat present within Project Site
Amphibians			
Southern long-toed salamander *Ambystoma macrodactylum sigillatum*	--/SSC	Found in moderate to high elevation (2,300-9,800 feet) meadows and lakes in Sierra Nevada, Klamath and Cascade Mountains.	**Moderate.** Suitable montane meadow habitat is present in burned and logged areas of the Project Site.
Coastal tailed frog *Ascaphus truei*	–/SSC	Cool perennial streams in conifer-dominated habitat including redwood, Douglas-fir, and ponderosa pine habitats in montane areas.	**High.** Known occurrences in the Project Site and suitable habitat present in the southern portion of the site.
Shasta salamander *Hydromantes shastae*	–/ST	Mixed conifer habitat near limestone caves at elevations from 1,000 to 3,000 feet, volcanic and other rock outcroppings; in rainy periods found under woody debris in mixed pine-hardwood stands.	**Low.** Recorded 5 miles west of Project Site, but outside of species' known distribution and elevational range.

TABLE 3.4-3 (CONTINUED)
SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR WITHIN THE PROJECT SITE

Species	Status	Habitat	Potential for Occurrence in the Project Site
Amphibians (cont.)			
California red-legged frog *Rana draytonii*	FT/SSC	Lowlands and foothills in or near permanent sources of deep water with dense, shrubby or emergent riparian vegetation	**Low**. Project Site on edge of this species' range; limited suitable habitat present within Project Site.
Foothill yellow-legged frog *Rana boylii*	–/SC, SSC	Creeks or rivers in woodland, forest, mixed chaparral, and wet meadow habitats with rock and gravel substrate and low overhanging vegetation along the edge; usually found near riffles with rocks and sunny banks nearby.	**Low.** Project Site on edge of this species' range; surveys, including eDNA sampling, did not identify occurrence of species on site.
Cascades frog *Rana cascadae*	–/CE, SSC	Ephemeral and permanent ponds and streams; oviposition habitat is open, shallow water in unshaded areas; overwinters underwater or in saturated ground.	**Low.** Known occurrence 1.2 miles southeast of the Leasehold Area; minimal and marginally suitable habitat in southern portion of Leasehold Area but no suitable habitat within the Project Site.
Reptiles			
Western pond turtle *Emys marmorata*	--/SSC	Aquatic species requiring ponds, marshes, rivers, streams, and irrigation ditches, usually with aquatic vegetation.	**Moderate.** Suitable aquatic habitat limited within the Project Site but may be present within pools of larger creeks or ponds; Species has been recorded near southwest corner of Project Site.
Birds			
Northern spotted owl *Strix occidentalis caurina*	FT/SSC	Mature forest, multi layered mixed conifers.	**None**. In Shasta County, northern subspecies occurs only north of the Pit River, which is outside of the Project Site.
California spotted owl	--/SSC	Nests in dense, old-growth, multi-layered mixed-conifer, redwood, and Douglas fir forests.	**Moderate.** Approximately 995 acres of suitable habitat is present in the southern portion of the Leasehold Area, outside the Project Site (Appendix C11). Historical records show occurrence onsite but suitable habitat no longer present within the Project Site. May nest in adjacent suitable habitat and forage within the Project Site.
Yellow-billed cuckoo *Coccyzus americanus*	FT/SE	Riparian forest along the broad, lower flood-bottoms of larger river systems; nests in riparian jungles of willow often mixed with cottonwoods.	**Low.** Rare breeder throughout California. Not known to occur near Project Site; suitable riparian habitat generally not present within the Project Site.
American peregrine falcon *Falco peregrinus anatum*	–/SE, FP	Permanent resident along North and South Coast ranges; Nests and roosts on protected ledges of high cliffs, usually adjacent to lakes, rivers, or marshes that support large prey populations.	**Low.** May fly through Project Site during migration or movement between foraging areas.
Bald eagle *Haliaeetus leucocephalus*	–/SE, FP	Primarily nests and roosts in coniferous forests close to a lake, reservoir, stream, or bay.	**High.** Observed during surveys (Appendix C9); nesting habitat located on and near Project Site.

TABLE 3.4-3 (CONTINUED)
SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR WITHIN THE PROJECT SITE

Species	Status	Habitat	Potential for Occurrence in the Project Site
Birds (cont.)			
California horned lark *Eremophila alpestris actia*	–/SSC	Resident in a variety of open habitats, usually lacking large trees and shrubs; grasslands and deserts to dwarf shrub habitats above tree line.	**Moderate.** Not observed during surveys; suitable habitat is present in Project Site.
Cooper's hawk *Accipiter cooperii*	–/SSC	Nests in a wide variety of habitat types, from riparian woodlands and grey pine–oak woodlands through mixed conifer forests.	**High.** Suitable foraging habitat in Project Site; observed during Project surveys (Appendix C4).
Golden eagle *Aquila chrysaetos*	–/SSC, FP	Nest on cliffs and escarpments or in tall trees overlooking open country; forages in annual grasslands, chaparral, and oak woodlands with plentiful prey.	**High.** Observed during surveys (Appendix C9). Likely to pass through Project Site during migration.
Ferruginous hawk *Buteo regalis*	–/SSC	Open terrain in plains and foothills where ground squirrels and other prey are available.	**High.** Likely to pass through Project Site during migration.
Northern goshawk *Accipiter gentilis*	–/SSC	Nests and roosts in older stands of red fir, Jeffrey pine, ponderosa pine, lodgepole pine, Douglas-fir, and mixed conifer forests.	**Moderate.** Suitable foraging habitat in Project Site with limited nesting habitat. Hawks may fly through the site during movement between foraging areas.
Sharp-shinned hawk *Accipiter striatus*	–/SSC	Dense canopy ponderosa pine or mixed-conifer forest and riparian habitats.	**High.** Observed during Project surveys (Appendix C4); may fly through Project Site during migration or between foraging areas.
Vaux's swift *Chaetura vauxi*	–/SSC	Summer resident of northern California and common migrant throughout state, prefers redwood and Douglas fir forests, occasionally other conifers, where it nests and roosts in large hollow trees and snags, and prefers foraging over rivers and lakes.	**High**. Observed during Project surveys (Appendix C4); may fly through Project Site during migration or nest nearby.
Willow flycatcher *Empidonax traillii*	–/SE	Riparian areas and large wet meadows with abundant willows. Usually found in riparian habitats during migration.	**Low**. Known occurrences within 10-mile radius of the Project Site; not observed during Project surveys (Appendix C12); may fly through Project Site during migration; potential nesting habitat in Project vicinity.
Yellow warbler *Dendroica petechia brewsteri* (nesting)	–/SSC	Uncommon summer resident and common migrant throughout much of California; nests in riparian areas dominated by willows, cottonwoods, sycamores, or alders or in mature chaparral; may also use oaks or conifers, with brushy understory.	**High.** Observed during Project surveys (Appendix C4); limited suitable nesting habitat in Project Site.
Greater sandhill crane *Grus canadensis tabida*	–/T, FP	Summers in open terrain near shallow lakes or freshwater marshes; winters in plains and valleys near bodies of fresh water.	**Moderate.** Known to pass through Project Site during migration but does not nest there.
Olive-sided flycatcher *Contopus cooperi*	-/BCC, SSC	Breeds in northern California, montane and coniferous forests, usually found in forest openings or edges and nests in prominent trees and snags.	**High.** Observed during Project surveys (Appendix C4); suitable forest edge nesting habitat is found in Project Site.

TABLE 3.4-3 (CONTINUED)
SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR WITHIN THE PROJECT SITE

Species	Status	Habitat	Potential for Occurrence in the Project Site
Birds (cont.)			
Cassin's finch *Haemorhous cassinii*	-/BCC	Open, coniferous forests of mountains, including ponderosa pine and Douglas fir, tend to be restricted to higher elevations in California.	**High.** Observed during Project surveys (Appendix C4); limited suitable nesting habitat found in Project Site.
Lewis' Woodpecker *Melanerpes lewis*	-/BCC	Open forests, riparian forests, burned pine forest, Breeds and winters in northern California.	**High.** Observed during Project surveys (Appendix C4); suitable open forest and burned forest habitat is found in Project Site.
Mammals			
Gray wolf *Canis lupus*	FE/SE	Habitat generalists, historically occupying diverse habitats including tundra, forests, grasslands, and deserts.	**Low.** Gray wolf has been documented in Shasta County (KRCRTV, 2020); natural recolonization of northern California is occurring from Oregon; suitable habitat is present within the Project Site.
Sierra Nevada mountain beaver *Aplodontia rufa californica*	--/SSC	Occurs in open brushy stages of most forest types as well as dense riparian-deciduous habitat. Requires friable soil for burrowing.	**Low.** Nearest detection more than 10 miles away; limited suitable habitat present on Project Site.
California wolverine *Gulo gulo*	--/ST	Higher elevation mixed conifer forests in northern Sierra Nevada; dens in dense forest and hunts in open areas adjacent to mixed conifer forests. Sensitive to disturbance.	**Low.** Occurrences east and northeast of the Project Site from approximately 50 years ago. Project Site contains suitable forest habitat but is frequently disturbed.
Oregon snowshoe hare *Lepus americanus klamathensis*	--/SSC	Found in vicinity of Mt. Shasta, Trinity and Warner mountains. Prefers riparian areas or other habitat with dense understory.	**Moderate.** The Project Site contains suitable habitat for this species.
Fisher *Pekania [=Martes] pennanti*	FC/SSC	Late successional coniferous forests and montane riparian habitats.	**High.** Known occurrences in vicinity; suitable habitat is present on Project Site.
American badger *Taxidea taxus*	–/SSC	Most abundant in drier, open stages of most shrub, forest, and herbaceous habitats with friable soils.	**Low.** Suitable habitat in Project Site is disturbed; not observed in Project surveys (Appendix C1).
Sierra Nevada red fox *Vulpes vulpes necator*	FC/ST	Historically ranged from southern Cascades to Sierra Nevada above 5,000 feet in subalpine forests of lodgepole pine and red fir. Chaparral and wet meadows may also be used.	**Low.** Project Site outside of known occupied range and nearest detection more than 10 miles away.
Pallid bat *Antrozous pallidus*	–/SSC	Occurs in a variety of habitats from desert to coniferous forest; most closely associated with oak, yellow pine, redwood, and giant sequoia habitats in northern California and oak woodland, grassland, and desert scrub in southern California; Relies heavily on trees for roosts.	**Moderate.** Suitable tree habitat present in Project Site; detections in acoustic surveys could not be confirmed (Appendix C6).
Townsend's big-eared bat *Corynorhinus townsendii*	–/SSC	Roosts in caves, tunnels, mines, and dark attics of abandoned buildings; very sensitive to disturbances.	**Low.** Minimal and marginal roosting and foraging habitat; uncommon colonial rooster; detections in acoustic surveys could not be confirmed (Appendix C6).

TABLE 3.4-3 (CONTINUED)
SPECIAL-STATUS WILDLIFE SPECIES WITH POTENTIAL TO OCCUR WITHIN THE PROJECT SITE

Species	Status	Habitat	Potential for Occurrence in the Project Site
Mammals (cont.)			
Spotted bat *Euderma maculatum*	--/SSC	Roosts in cracks, crevices and caves usually high above ground in rock cliffs and canyons or high elevation coniferous forests; forages in meadows, riparian areas, canyons and forests.	**Moderate.** Uncommon solitary bat; minimal and marginal roosting habitat on Project Site, but suitable foraging habitat; detected in acoustic surveys in low numbers (Appendix C6).
Western red bat *Lasiurus blossevillii*	--/SSC	Roosts in foliage in intact riparian habitat; day roosts in edge habitats near streams or fields; may feed around streetlights.	Moderate. Uncommon solitary bat; suitable habitat on Project Site; detections in acoustic surveys could not be confirmed (Appendix C6).
Western mastiff bat *Eumops perotis californicus*	–/SSC	Wide variety of habitats from desert scrub to montane conifer; roosts and breeds in deep, narrow rock crevices, may also use crevices in trees, buildings, and tunnels.	Moderate. Limited suitable roosting habitat present in Project Site; detected in acoustic surveys in low numbers (Appendix C6).

NOTES:
FE: federally-listed endangered species; FT: federally-listed threatened species; FC: federal candidate species for listing; SE: state-listed endangered species; ST: state-listed threatened species; SC: state-listed candidate species; FP: state fully protected species; SSC: state species of special concern. Species status from USFWS 2020a, CDFW 2020

Mixed conifer, scrub, and chaparral areas on the Project Site are suitable for reptiles such as western fence lizard (*Sceloporus occidentalis*), sagebrush lizard (*Sceloporus graciosus*), western skink (*Eumeces skiltonianus*), western whiptail (*Cnemidophorus tigris*), northern alligator lizard (*Gerhonotus coeruleus*), rubber boa (*Charina bottae*), sharp-tailed snake (*Contia tenuis*), gopher snake (*Pituophis melanoleucus*), common kingsnake (*Lampropeltis getulus*), western terrestrial garter snake (*Thamnophis elegans*), and western rattlesnake (*Crotalus viridis*).

The Project Site is located within the Pacific Flyway and numerous birds likely migrate through the region. The Project Site contains stopover habitat for songbirds, waterfowl, and shorebirds in the form of conifer forest, scrub-shrub, and riparian and wetland habitats. The Project Site is characterized by rolling mountain terrain that generally would not be expected to concentrate or funnel raptors during migration; however, potential exists for migrating raptors to use updrafts and thermals created by topography and to be attracted to riparian areas within the study area. Red-tailed hawk (*Buteo jamaicensis*), Cooper's hawk (*Accipiter cooperii*), and other common raptor species may be present as residents and/or migrants in the Project Site. In addition, turkey vulture (*Cathartes aura*), great horned owl (*Bubo virginianus*) and other species of owls may also occur in the Project Site. Nesting habitat for owls and forest-dependent raptor species is present throughout the Project Site and vicinity.

While not currently found in the Leasehold Area, California condors' reintroduction to northern coastal California could begin in 2020 (Appendix C1). If reintroduction efforts are successful, there is a possibility that condors could recolonize inland portions of northern California, including the Project Site, at some point in the future. However, the likelihood of this recolonization is currently unknown.

The Project Site has ample forest that could provide roosting habitat for bats and wetland and riparian habitat that may be important foraging habitat. Bat species including California myotis (*Myotis californicus*), small-footed myotis (*Myotis ciliolabrum*), little brown bat (*Myotis lucifugus*), silver-haired bat (*Lasionycteris noctivagans*), and hoary bat (Lasiurus cinereus) have the potential to occur within the Project Site (Appendix C6). The Project Site also has suitable habitat for mule deer (*Odocoileus hemionus*) fawning, and for numerous smaller mammal species. Mammals found in mixed conifer forest include mule deer, Roosevelt elk (*Cervus elaphus roosevelti*), black bear (*Ursus americanus*), and cougar (*Puma concolor*), as well as smaller carnivores such as American marten (*Martes americana*), spotted skunk (*Spilogale gracilis*), striped skunk (*Mephitis mephitis*), porcupine (*Erithrozion dorsatum*), and raccoon (*Procyon lotor*). Smaller mammals that may be present include western gray squirrel (*Sciurus griseus*), long-tailed weasel (*Mustela frenata*), dusky-footed woodrat (*Neotoma fuscipes*), western jumping mouse (*Zapus princes*), montane vole (*Microtus montanus*), western harvest mouse (*Reithrodontomys montanus*), and deer mouse (*Peromyscus maniculatus*).

Sensitive Biological Resources

Sensitive biological resources addressed in this analysis include special-status species and sensitive habitats that are afforded consideration or protection under CEQA, the California Fish and Game Code, the California Endangered Species Act (CESA), the federal Endangered Species Act (FESA), the Clean Water Act, the Migratory Bird Treaty Act (MBTA), the Porter-Cologne Water Quality Control Act (Porter-Cologne Act), and the Bald and Golden Eagle Protection Act.

Special-Status Species

For the purpose of this analysis, "special-status species" are plants and animals within any of the following categories:

- Species that are listed under the FESA and/or CESA as rare, threatened, or endangered;
- Species considered as candidates and proposed for federal or state listing as threatened or endangered;
- Wildlife designated by CDFW as fully protected and/or species of special concern (SSC);
- Birds designated by CDFW as watch list species;
- Birds protected under the MBTA;
- Bats designated by the Western Bat Working Group (WBWG) as high (red) or medium (yellow) priority; or
- Plants ranked by CDFW to be rare, threatened, or endangered in California.

Based on focused rare plant surveys and natural community vegetation mapping performed in 2018 and 2019, sensitive natural communities do not occur on the Project Site (Appendix C3).

Invertebrates

The CNDDB query for the Project Site and vicinity identified five federally listed invertebrate species in the region (CDFW, 2020). These species were evaluated for potential to occur in the Project Site. Three of the species, Conservancy fairy shrimp (*Branchinecta conservatio*), vernal pool fairy shrimp (*Branchinecta lynchi*), and vernal pool tadpole shrimp (*Lepidurus packardi*) are specialized for Central Valley vernal pool habitats, which are not present on the Project Site and have no potential to occur. The Shasta crayfish (*Pacifastacus fortis*) has been identified only in the Fall River and Hat Creek subdrainages of the Pit River system upstream of the Project Site drainages in clear gravel shallows. It has low potential to occur in the Project Site. Valley elderberry longhorn beetle (*Desmocerus californicus dimorphus*) is found in association with blue elderberry (*Sambucus mexicanus*) in the Central Valley, south and east of the Project Site. Elderberry shrubs have not been found in the Project Site and therefore the valley elderberry longhorn beetle has a low potential to occur.

Fish

The Site Characterization Study for the Project Site (Appendix C1) examined USFWS and CNDDB species lists and evaluated the available habitat on site. The special-status fish in the region, including bull trout (*Salvelinus confluentus*), Chinook salmon (*Oncorhynchus tshawytscha*) spring and winter run, and Central Valley DPS steelhead (*Oncorhynchus mykiss irideus*), McCloud River redband trout (*Oncorhynchus mykiss ssp.* 2), bigeye marbled sculpin (*Cottus klamathensis macrops*), hardhead (*Mylopharodon conocephalus*), and Pacific lamprey (*Entosphenus tridentatus*) were found to have no potential to occur within the Project Site due to the absence of suitable habitat, or location out of range. These species require large stream and river systems with deep, cold, flowing water. Bull trout are also believed to be extinct in the state of California (Appendix C1).

One California SSC, the Pit roach (*Lavinia symmetricus mitrulus*), has low potential to occur within the Project Site (Appendix C1). Pit roach inhabit both deep pools and areas of low flow, moderate gradients, warm temperatures, and mats of vegetation. There is one CNDDB occurrence of Pit roach 2.7 miles north of the Project Site, within the Pit River and tributaries (Appendix C1). The channels within the Project Site have low potential to support this species. Due to the local terrain for watersheds in the Project's vicinity, hydrological conditions for surface waters tend to be flashy in the winter months and dry in the summer depending on snow melt and winter rains.

Reptiles

Western Pond Turtle

The western pond turtle (*Emys marmorata*), a medium-sized turtle, is a California SSC. The species occurs in a variety of aquatic habitats including streams, rivers, irrigation ditches, ponds, and marshes. Western pond turtles prefer habitats containing ample amounts of aquatic vegetation, muddy or rocky bottoms, and sparsely vegetated banks for basking. The species occurs throughout various elevations in northern California, ranging from sea level to nearly 7,000 feet. Suitable habitat is found within the Project Site, though it is limited to small ponds and/or stream pools (Appendix C1). Within the Project Site, a total of 10.04acres of aquatic habitat resides within

ponds, perennial streams, and intermittent streams (Table 3.4-1). These three aquatic habitat types are most likely to contain suitable western pond turtle habitat. Other aquatic habitat types such as riparian wetlands, freshwater emergent wetlands, wetland meadows, and wetland seep/springs may support western pond turtle populations during wetter years. Approximately 27 acres of potentially suitable aquatic habitat types are present on-site (Table 3.4-2).

While no known populations of the species exist within the Project Site, there is a known CNDDB occurrence from 2004 just outside of the southwestern boundary. This species has a moderate potential to occur within the Project Site.

Amphibians

Coastal Tailed Frog

The Coastal tailed frog (*Ascaphus truei*) is a California SSC. Habitat is restricted to montane areas of hardwood-conifer, redwood, Douglas-fir and ponderosa pine with perennial streams. There is potential suitable habitat within the Project Site, toward the southern boundary, and the species has been documented near the center of the Project Site (Appendix C1). This species has high potential to occur within the Project Site.

Southern Long-Toed Salamander

The Southern long-toed salamander (*Ambystoma macrodactylum sigillatum*) is a California SSC. Preferred habitat is montane meadows and lakes at high elevation and its range includes the Sierra Nevada, Cascade and Klamath mountains (Appendix C1). This species has moderate potential to occur within the Project, as suitable montane meadow habitat is present within the Project Site in burned areas and areas cleared by logging.

Shasta Salamander

Shasta salamander (*Hydromantes shastae*) is a state-listed threatened species (CDFW, 2020). This species is not common, with distribution being comprised of numerous, isolated populations occurring near valley-foothill limestone regions of Shasta County (Appendix C1). Preferred habitat includes hardwood conifer, ponderosa pine, and mixed-conifer habitat typically found from 1,100 to 2,550 feet (335 to 777 meters). These salamanders are most active during wet seasons and retreat to limestone fissures and caves during dry seasons, using logs and talus for cover (Appendix C1). The Project Site is outside of the known species' range, which is limited to the vicinity of Shasta Reservoir to the west. While there does not appear to be suitable habitat within the Project Site boundary, the species has been documented 5 miles to the west. This species has low potential to occur within the Project Site.

Foothill Yellow-Legged Frog

Foothill yellow-legged frog (*Rana boylii* [FYLF]) is a California SSC, a candidate for listing as threatened under the California Endangered Species Act (CESA) and is currently being reviewed for potential listing as threatened or endangered under the FESA. Several occurrences of FYLF have been documented in the vicinity of the Project Site in rocky stream habitat, and although the species has not been documented within the development corridors, and the Project is

proposed on the edge of the species' range, the species has potential to occur within the Project Site (Appendix C13a). However, Project-specific visual encounter surveys in 2018 and eDNA surveys in 2019 throughout the Project Site yielded no detections of this species (Appendix C13a and C13b).

Cascades Frog

The Cascades Frog (*Rana cascadae*) is a California SSC (CDFW, 2020). This species typically inhabits montane lakes, streams, ponds, and wet meadows and can be found in coniferous forests at elevations below 8,200 feet (2,500 meters) (Appendix C1). Reproduction of this species requires shallow, still water, and winter hibernation occurs on lake or pond bottoms. The known current range of this species overlaps only a small area in the southern portion of the Project Site. While the species has been documented 1.2 miles southeast of the Leasehold Area, Project-specific analysis in 2018 indicated only 75 acres of low-quality potential habitat in the southern portion of the Leasehold Area (Appendix C13a). Habitat mapping in the field determined that the potential habitat was not suitable for this species, and visual surveys for Cascade frog were determined to be unnecessary. This area of potential habitat was located in the southernmost portion of the Leasehold Area, and not located within the Project Site.

California Red-Legged Frog

California red-legged frog (*Rana draytonii*) is protected under the FESA (1973) as a threatened species (USFWS, 2020a). California red-legged frog range includes the coast ranges south from Mendocino County and includes part of the Cascades and Sierra Nevada. They are typically found in lowlands or foothills (Appendix C1) below 3,900 feet (1,200 meters) in elevation. Their preferred habitat is shoreline near permanent sources of deep water with dense, shrubby or emergent riparian vegetation (Appendix C1). They also inhabit marshes, calm pools along streams, and ponds. California red-legged frog require year-round pools for larval development. The Project is proposed at the northern extent of the frog's known range, and there may be suitable habitat within the Project Site boundary. However, this species is rare in the region and there have been no documented occurrences within Shasta County or the Project Site during site biological surveys (CDFW, 2020). Thus, the species has low potential to be present.

Birds

California Spotted Owl

The California spotted owl (*Strix occidentalis occidentalis*) is a California SSC (CDFW, 2020). In northern California, this species is associated with dense, old-growth, multi- layered mixed-conifer, redwood, and Douglas fir forests. While the California spotted owl (CSO) was recently petitioned for listing at the federal level, the listing was found not warranted in 2019 (Appendix C11). In their assessment, the USFWS found that the primary threats to the CSO are large-scale, high-severity fire, increased tree mortality, drought, effects of climate change, and the barred owl (*Strix varia*) invasion (USFWS 2019).

Suitable nesting/roosting habitat for CSO includes areas of complex-structured/multi-layered forest, high canopy cover, and the presence of old and decadent trees, large snags, and coarse

downed woody debris (Gutiérrez et al., 2017). The CSO forages in forested habitats that are generally similar to nesting and roosting habitat. The California spotted owl tends to avoid crossing brushy and clearcut forest areas, although they may hunt along forest edges. Their core areas may range from 300 to 2,000 acres.

The Project Site is located at edge of the geographic range of the CSO and high-quality nesting/roosting habitat is not present within the Project Site boundary. Approximately 995 acres of suitable habitat is present in the southern portion of the Leasehold Area, outside the Project Site (Appendix C11).

The Fountain Fire, which burned much of the central half of the Project Site in 1992, has resulted in a limited the amount of nesting habitat for some forest-nesting species, but may be suitable for species preferring more open forest and scrub habitats (i.e., early seral) for nesting such as the American kestrel, red-tailed hawk, great horned owl, and western screech-owl (Appendix C11). However, it is possible that the California spotted owl may forage within or disperse through Project Site and there are historical records of occurrence in the Project Site (CDFW, 2020). CSO have been documented in the vicinity of the Project Site (CDFW, 2020). Three historical activity centers are located within 2.0 miles southeast of the Project Site and one historical activity center was located near the center of the Project Site (Appendix C11). Although these owl detections are older, additional surveys for CSO have likely not been conducted in the area since surveys were conducted in the early 1990's. Therefore, CSO could still inhabit the areas with medium and high predicted habitat suitability in the southeastern portion of the Project Site. It should be noted that during other intensive (non-owl-specific) avian surveys conducted for the Project (Appendices C4, C7, C8 and C9) CSO was not detected. These efforts included two years of avian point count surveys.

Since the Project Site is located in proximity to much larger contiguous areas of high suitability habitat on the Shasta Trinity National Forest to the north and west and the Lassen National Forest to the southeast, CSOs are less likely to select to use the more fragmented and less suitable habitats within the heavily managed timberlands present within the Project Site (Appendix C11).

The northern spotted owl (*Strix occidentalis caurina*), is federally listed as threatened, and prefers mature coniferous forests and multi-layered mixed conifer forests. However, this species is not present within Shasta County, since this northern subspecies, for management purposes, is considered only to occur north of the Pit River, which is outside of the Project Site (Appendix C1). The Pit River runs approximately 4.7 miles north of the Project Site. This species is not discussed further in this EIR.

Great Gray Owl

The likelihood of occurrence of the great gray owl (*Strix nebulosa*) within the Project Site and in the region was assessed for purposes of the Project (Appendix C5). The great gray owl is designated as endangered by the state of California (CDFW, 2020). Great gray owl nesting habitat in California is most commonly associated with dense forest stands adjacent to montane meadow foraging habitat. Suitable nesting habitat includes mature or old-growth conifer stands with greater than 50 percent canopy cover containing potential nest trees. Nest trees include

broken-top snags greater than 16-inches in diameter at breast height,[1] trees containing pre-existing stick nests from other species and mistletoe brooms. The estimated state-wide population size is only 100-200 pairs. Although the Project Site is located within the historical range of the species, there were no known occurrences of great gray owl within or immediately adjacent to the Project Site and the nearest known occupied territories were located approximately 85 miles to the northeast in Modoc County (CDFW, 2020). In addition, during other intensive avian studies conducted for the Project (Appendices C4, C7, C8, and C9), this species was never detected. These efforts included 2 years of avian point count surveys and surveys for northern goshawk and willow flycatcher. However, none of these surveys were conducted at night and no surveys were specifically conducted for this species within the Project Site.

In addition, there is no nesting and foraging habitat available for this species within the Project Site. However, there is a small amount of suitable habitat within a private in-holding located northeast of the Project Site, but this habitat is isolated and not known to be used by great gray owl (Appendix C5). A review of potentially suitable nesting or foraging habitat in other areas of the Project Site found no other suitable habitat (Appendix C5). Therefore, this species is not expected to be present, and will not be discussed further in this EIR.

Northern Goshawk

The northern goshawk (*Accipiter gentilis*) is a medium-large raptor with a broad distribution in the western United States, including California and the Project Site. In California, it is considered an SSC when nesting (CDFW, 2020). The northern goshawk can occupy a variety of habitats but prefers mature coniferous and deciduous forests. They eat a variety of prey that includes small mammals and birds. Catching most prey while in flight, goshawks prefer to hunt in more open areas such as cleared forest patches, dense forests with open understories, and along waterways. This species is particularly sensitive to forest management practices that reduce or fragment habitat.

Mainly resident, some individuals from high latitude regions migrate south for the winter. Individuals in North America migrate south along mountain ridge tops at nearly any time of the fall depending on latitude. Over much of their California range, northern goshawks nest mainly in mature and old-growth forest stands. Suitable stands would occur in a broad range of conifer and conifer-hardwood types such as Ponderosa pine. This hawk prefers the densest stands available for nesting, and those with a high canopy closure and open understories for foraging. There is a limited amount of mature forested habitat within the southeast portion of the Project Site (Appendix C1). Within their territories, goshawks will alternate the use of as many as eight nests sites that can be located up to 1.1 miles (1.8 km) apart.

Project-specific surveys were conducted for goshawks to provide a more current assessment of potential presence of active nests in four historical occurrence areas in CNDDB (Appendix C8). Five goshawk detections occurred within the Project Site between April 2017 and May 2018 during fixed-point large bird use surveys and incidental observations (Appendix C4a, Appendix C4b). Two goshawk nests also were found in the Project Site during nest surveys, both inactive, with one in use

[1] The standard position for diameter measurements at standing trees is at breast height, which in the United States is defined as approximately 4.5 feet.

by a great horned owl (*Bubo virginianus*) and the other in a state of unusable disrepair (Appendix C8). During the acoustic surveys, goshawks were not detected, either visually or by ear, and no evidence of nesting goshawks was observed. Although the report authors concluded that the likelihood of nesting goshawks is low in those areas surveyed, this conclusion is not necessarily representative of the entire Project Site. Suitable goshawk habitat occurs in the southeast portion of the Project Site, and properties overlapping with the Cedar Boots timber harvest plan have timber and goshawk management plans in place that protect the species and their nests during logging practices (CAL FIRE, 2016). Overall, the species has moderate potential to be present onsite.

Bald and Golden Eagles

The bald eagle (*Haliaeetus leucocephalus*) is federally protected by the Bald and Golden Eagle Protection Act, is fully protected in California, and is state-listed as endangered. Aerial and ground-based eagle and raptor nest surveys were conducted for the Project during breeding seasons from 2017-2019, as well as fixed-point eagle use surveys from April 2017 through March 2019 (Appendix C9). Project eagle nest surveys found from nine (2017) to eleven (2019) occupied bald eagle nests within 10 miles of the Project Site, with the majority along the Pit River and the closest 2.9 miles from the Project Site boundary. The Pit and Fall rivers support large populations of breeding and wintering bald eagles (Appendix C9). The results of fixed-point eagle use surveys included 22 observations of bald eagles over a two-year survey period, with 13 of the 22 observations made in winter.

The golden eagle (*Aquila chrysaetos*) is federally protected by the Bald and Golden Eagle Protection Act, and is state fully protected in California. Aerial nest surveys found no nesting golden eagles within 10 miles of the Project boundary; this includes three historical golden eagle nests, which could not be located during either year of aerial surveys. While golden eagle nest habitat is not present in the Leasehold Area, golden eagles may nest in the region. During the two-year fixed-point eagle use survey, three golden eagle observations were made. All three observations of golden eagles were made during the spring migration season (Appendix C4).

Greater Sandhill Crane

Greater sandhill cranes (*Grus canadensis tabida*) were once abundant breeders on the Modoc Plateau of northeastern California but are now less abundant and found in the northern and southern regions of the Central Valley. This subspecies is State Threatened on their nesting and wintering grounds because of declining numbers and a reduction in its Pacific Flyway stopover habitat. *G. c. tabida* of the Central Valley population are migratory between nesting areas in British Columbia, Washington, Oregon and northeast California to wintering areas of in the Central Valley and south (Appendix C1). Sandhill cranes typically use large freshwater marshes, prairie ponds, and marshy tundra during summer and grain fields or prairies during migration and winter. Greater sandhill crane nesting or stopover roosting habitat does not occur within the Project Site. The closest known nesting habitat is located approximately 20 miles east of the Project Site, in the Fall River Valley Important Bird Area (Appendix C1), but cranes may stop over in other suitable open wetlands in the region. Over 100 sandhill cranes were observed in flight during Fountain Wind avian surveys (Appendix C4). Sandhill cranes are moderately likely to migrate over the Project Site in spring and fall.

Sandhill cranes can fly from 15-50 miles per hour, depending on wind speed and direction, and they utilize thermals to help gain altitudes of up to 12,000 feet; typically, they migrate at altitudes of less than 5,000 feet. When migrating, sandhill cranes can average 150 miles to over 400 miles a day, usually during daylight hours to take advantage of favorable wind conditions (USFWS, 2020b). As noted in Table 3.4-3, the potential for this species to occur in the vicinity of the Project Site is moderate.

Willow Flycatcher

In 2018, the willow flycatcher was designated as State Endangered (CDFW, 2020). Surveys for the Project (Appendix C12) found no willow flycatcher within or immediately adjacent to the Project Site. The nearest known occupied territories were located approximately 20 miles to the northeast of the Project Site (CDFW, 2020). Two years of avian point count surveys throughout the Project Site also failed to detect any willow flycatchers. However, avian point count surveys were conducted for the purpose of identifying all birds using the Project Site. Specific surveys for willow flycatcher were not required, based on the lack of records of willow flycatcher presence in the vicinity of the Project Site.

Biologists also assessed the occurrence of willow flycatcher habitat within the Project Site. Willow flycatcher breeding habitat consists of dense deciduous riparian shrub and willow thickets both of which are present within the Project Site. This species stays close to their preferred habitat of willow thickets and brushy riparian areas, perching and flying between low lying willow thickets. Areas of preferred habitat including willow thickets and brushy riparian areas within the Project Site were mapped and then buffered by 300 feet to ensure all the habitat was covered and that the average territory size of the willow flycatcher was also included. Three potential willow flycatcher habitat sites were surveyed during the 2018 nesting season (Appendix C12), with listening periods and playback calls conducted to elicit call responses from breeding birds. No willow flycatchers were detected. The Project Site could be used as stop-over and foraging habitat for migrating willow flycatchers during spring and fall, as suitable riparian habitat likely exists on federally-managed lands to the north and south. However, as noted in Table 3.4-4, the potential for this species to occur on site is low.

Migratory and Resident Raptors

Avian point count studies were conducted over a 2-year period in all four seasons from 2017 to 2019 (Appendix C4a, Appendix C4b). Large birds included waterbirds, waterfowl, shorebirds, diurnal raptors, vultures, upland game birds, doves and pigeons, and large corvids. Large bird surveys were conducted approximately once per month at 39 observation points, with approximately 9-10 points surveyed each week of the study period (Appendix C4a, Appendix C4b). During 60-minute large bird surveys, a total of 3,267 observations were recorded in Year 1 and 8,459 observations were recorded in Year 2. This included documentation of 25 and 22 separate large bird species in Year 1 and 2, respectively.

The surveys found that seasonal trends in diurnal raptor use were very similar between years, with the fall and spring migration periods having the highest use (Appendix C4b). Fifteen species of diurnal raptors were detected over all seasons during the two years of surveys, including

Cooper's hawk, northern goshawk, sharp-shinned hawk, ferruginous hawk, red-tailed hawk, rough-legged hawk, northern harrier, red-shouldered hawk, bald eagle, golden eagle, merlin, American kestrel, osprey, prairie falcon and turkey vulture (Appendix C4b). The red-tailed hawk had the highest use of any diurnal raptor species during all four seasons. Among other diurnal raptor species, sharp-shinned hawk and Cooper's hawk had relatively high use in fall and spring. Overall, raptor use was higher during migration seasons.

Diurnal raptors that have the potential to occur within the Project Site include the State Threatened Swainson's hawk, white-tailed kite and American peregrine falcon (the latter two are state fully protected species). None of these three species was recorded during two years of large bird surveys. The northern harrier, a California SSC, was recorded in both years within the Project Site. Six other species of raptors on the CDFW watch list that were observed include the Cooper's hawk, ferruginous hawk, merlin, prairie falcon, osprey, and sharp-shinned hawk (Appendix C4b).

Nine owl species have potential to nest within the Project Site or surrounding area including the barn owl (*Tyto alba*), barred owl (*Strix varia*), flammulated owl (*Otus flammeolus*), great horned owl (*Bubo virginianus*), long-eared owl (*Asio otus*), northern pygmy owl (*Glaucidium gnoma*), northern saw whet owl (*Aegolius acadicus*), California spotted owl (*Strix occidentalis occidentalis*), and western screech-owl (*Megascops kennicottii*) (Appendix C1). Additionally, short-eared owl (*Asio flammeus*) may be a permanent resident and breeder regionally, and burrowing owl (*Athene cunicularia*) may be a winter resident regionally but neither is likely to be found in the forested habitats of the study area. Of the owl species potentially occurring within the Project Site, the California spotted owl and long-eared owl are California SSC. During the two years of avian surveys (not focused owl surveys), only the northern pygmy owl and great horned owl were detected within the Project Site (Appendix C4).

Other Resident and Migratory Birds

The Project Site is located within the Pacific Flyway and numerous species of birds are known to migrate through the region. The Pacific Flyway is a major north-south flyway for migratory birds and extends from Alaska to Patagonia and spans the western U.S. From the results of two years of avian point count studies conducted within the Project Site, the site contains some stopover habitat for migratory birds including raptors and songbirds, but not for waterfowl or waterbirds (Appendix C4a, Appendix C4b). This habitat ranges from forests to grassland/ shrub-scrub habitats with smaller areas of riparian and wetland habitat.

Waterfowl

Five species of waterfowl were recorded during two years of surveys within the Project Site, with snow goose (*Chen caerulescens*) accounting for the majority of use in winter and fall, and greater white-fronted goose (*Anser albifrons*) accounting for nearly all spring use (Appendix C4a, Appendix C4b). Other waterfowl species observed over the two years of surveys included the cackling goose (*Branta hutchinsii*), Canada goose (*Branta canadensis*), and tundra swan (*Cygnus columbianus*). Tundra swans were observed rarely but in large flocks. Waterfowl were observed most frequently during winter and during migration.

Waterbird use, comprising two species, American white pelican (*Pelecanus erythrorhynchos*) and sandhill crane (*Antigone canadensis*), was highest in winter. The American white pelican is a California SSC. No waterbird use was recorded in summer. Almost all the waterfowl and waterbird use occurred in the fall and winter indicating that these birds were migrating over the area and neither using migratory stop-over habitats within the Project Site nor breeding there.

Other large birds commonly detected in both years of avian surveys within the Project Site included band-tailed pigeon (*Patagioenas fasciata*) and common raven (*Corvus corax*). Very small numbers of mountain quail (*Oreotyx pictus*), common nighthawk (*Chordeiles minor*), and American crow were also detected (*Corvus brachyrhynchos*) (Appendix C4a, Appendix C4b).

Songbirds

Songbird (small bird) surveys were conducted separately from large bird surveys. Two years of small bird surveys were conducted at the same 39 observation points used for the large bird surveys. During 10-minute small bird surveys in Year 1, 2,408 small bird observations were recorded of 71 species while in Year 2, 1,711 small bird observations were recorded of 50 species (Appendix C4b). The most abundant birds observed in the two years of avian surveys included dark-eyed junco (*Junco hyemalis*), mountain chickadee (*Poecile gambeli*), western bluebird (*Sialia mexicana*) and Steller's jay (*Cyanocitta stelleri*), with woodpeckers also common. Small bird abundance in both years of avian surveys was highest in the fall, followed by summer and spring, and lowest in the winter. Species richness across both years of small bird surveys was highest in summer. The seasonal abundance and species richness results suggest that small bird use is moderate and relatively consistent across seasons and across the Project Site. The results of small bird avian surveys further suggest that there is no specialized use of nesting habitats by resident birds, use of the area by migratory songbirds is non-concentrated. The following sections highlight songbirds observed on the Project Site that are California SSC.

Vaux's Swift

Little is known about life history traits of the Vaux's Swift (*Chaetura vauxi*) in California, where the species generally arrives the first week of April through late May. Vaux's Swift may roost individually or in communal groups. Communal roosts are typically large specialized structures capable of accommodating more than a hundred individual birds and can include mature and old-growth conifers with large top or side cavities as well as man-made structures like chimney (Shuford and Gardali, 2008). In fall, birds arrive to roost sites in northwestern California around late September. This species is a diurnal migrant that flies at heights just at the limit of sight, gathering and circling in large flocks up before dusk in the vicinity of roost sites. The Avian Use Study reported observing a fly-by of a single group comprised of 35 individuals. No communal nest locations or potential nest sites were identified in the Project Site (Appendix C4).

Olive-sided Flycatcher

The olive-sided flycatcher (*Contopus cooperi*) breeds along the edges and openings of forests, including burned areas, and around the edges of wetlands. It uses tall, prominent trees and snags for singing and as foraging perches because of the unobstructed air space they offer. It arrives in northern California from wintering grounds in early May and leaves again in fall. It is more often

detected along edge habitats than elsewhere in the forest interior and it is often present near water, possibly because of higher insect abundance in these areas. The species in western North America has a proclivity for burned areas. Migratory habitat in spring is mainly mountain areas, although winter habitat includes more riparian and non-coniferous habitats. This species feeds on flying insects caught on the wing; hunting in this manner requires open air space for launching from and returning to foraging perches – as opposed to other flycatcher species that forage in mid-air.

Yellow Warbler

The yellow warbler (*Setophaga petechia*) is a widespread and abundant bird in North America, but occurrence is fragmented and local in the southwest part of the country where it is limited to riparian corridors. The species is largely absent from the Central Valley region and the southern and eastern desert areas of California. Migrants pass through northwest California in April and again in August to September. Found typically in riparian habitats, it is primarily an insectivore. During migration, collision fatalities occasionally occur at television towers and other tall, lighted structures. Preferred breeding areas are wet, deciduous thickets dominated by willows and in disturbed and early successional habitats.

Cassin's Finch

The Cassin's finch (*Haemorhous cassinii*) typically inhabits high elevation coniferous forests in the spring and summer months, descending to lower elevations or migrating south in the winter, though populations in northeastern California may be year-round residents. Conspicuous and vocal in mixed species foraging flocks, and excellent at mimicking the calls of other species, this species primarily eats fruits including berries, plant buds, and seeds, and infrequently insects while foraging on the ground. There is little information on nesting habits of this species, but nest building likely occurs May and June, with timing influenced by elevation. Cup nests are placed in outer branches away from the tree's trunk and, in California, in primarily ponderosa and Jeffrey pine trees. Birds depart the nest and the area as soon as chicks fledge.

Lewis's Woodpecker

Lewis's woodpecker (*Melanerpes lewis*) is a California SSC (CDFW, 2020). When pursuing insects on the wing in summer months, it exhibits prolonged gliding and complex aerial maneuvers; in winter its diet is acorns and other nuts, which it caches in bark crevices. In fall and winter, high concentrations of this species can occur in northern California where oak mistletoe berries are abundant. This woodpecker prefers open forests, ranging from low-elevation riparian areas to higher-elevation burns and pine forests for breeding, and it requires snag trees either standing, dead, or partly dead for nesting. Rather than excavating cavities in wood, this species selects trees already well decayed. Lewis's woodpeckers tend to be locally distributed within their range but is somewhat sporadic in occurrence. It arrives to breeding grounds in early May and departs again around late August or early September. Trends are difficult to assess for this species, but indications point to broad-scale and local-scale decline, probably due to loss of suitable habitat, habitat degradation, and pesticides.

Mammals

Gray Wolf

The gray wolf (*Canus lupis irremotus*) is federally endangered (USFWS, 2020a) and California threatened (CDFW, 2020). Once extirpated from California, gray wolves have been detected in Northern California in recent years, beginning in 2011 (Appendix C1). Gray wolf habitat preference and utilization often reflects the distribution of prey on the landscape rather than direct selection for cover type, with seasonal movements following ungulate migration. Wolf territories usually encompass a variety of habitat types, including forests, meadows, rocky ridges, lakes, and rivers. Springtime natal dens are constructed in well-drained soils in meadows near water sources, in hollow logs, under tree roots, or rock outcrops. CDFW has noted that gray wolves have passed through or adjacent to the Project Site in recent years, and a suspected wolf track was documented at the Project Site in the winter of 2018 (Appendix C10). An adult female gray wolf was found dead in Shasta County in February 2020 (KRCRTV, 2020).

The species requires large, diverse, and undisturbed territories. These habitat preferences limit the possibilities for coexistence with silvicultural and development activities on the Project Site. While the likelihood of gray wolves within the Project Site increases as the species population increases in Northern California, the tendency of this species to traverse long distances and to avoid disturbance would decrease its likelihood of denning in the Project Site.

California Wolverine

The California Wolverine (*Gulo gulo*) is state listed as threatened in California, where its preferred habitat includes higher elevation mixed conifer forests with seasonal snowfall in the Northern Sierra Nevada (CDFW, 2020). The species primarily subsists on a diet of small mammals and carrion, often hunting in open areas adjacent to mixed conifer forests, where dense forest cover provides denning habitat. California wolverines tend to avoid human disturbance and can range large distances within suitable habitats (Appendix C1). Within the Project Site is suitable mixed conifer forest habitat, although the site is a working forest landscape with frequent disturbance. Several occurrences of this species have been noted to the east and on the northeast boundary of the Project Site, though the records are 50 years old (CNDDB, 2020). This species is unlikely to occur within the Project Site.

American Badger

The American Badger (*Taxidea taxus*) is an uncommon permanent resident of California, most commonly found in grassland, shrubland, agricultural, and woodland edge habitats with friable soil for burrowing. It is a California SSC. Badgers are carnivorous and prey on a variety of species, including ground squirrels, reptiles, birds, and carrion depending on seasonal availability. The CNDDB documents badgers 6.5 miles east of the Project (CDFW, 2020), but suitable open habitat for badgers is lacking on the Project Site; thus, this species is unlikely to occur.

Fisher

The West Coast distinct population segment (DPS) of fisher (*Pekania [=Martes] pennant*) is proposed Threatened by the USFWS and currently under review (USFWS, 2019). The Northern

California evolutionarily significant unit (ESU) – consisting of fishers that occur within California in the Klamath Mountains, Coast Range, southern Cascades, and northern Sierra Nevada – is a California SSC. Fishers are opportunistic, generalist predators, that prefers mature, dense forest stands. Suitable habitat will also contain snags, hollow logs, brush piles, and similar types of denning cover. The CNDDB documents several occurrences of fishers within the Project Site, and in the surrounding area (CDFW, 2020). This species has high potential to occur within the Project Site.

Oregon Snowshoe Hare

The Oregon Snowshoe Hare (*Lepus americanus klamathensis*) is a subspecies of snowshoe hare that occurs in the vicinity of Mt. Shasta, the Trinity Mountains, and the Warner Mountains. It is a California SSC. The snowshoe hare prefers heterogeneous habitats with dense understory, as well as riparian habitats, and is rarely found in open habitat or mature closed canopy forests. The Project landscape is patchwork of heterogeneous habitats, due to both logging and fire, and appears to contain suitable habitat for the snowshoe hare. This species is moderately likely to occur within the Project Site.

Deer Habitat

The Project Site includes Columbian black-tailed deer (*Odocoileus hemionus columbianus*) fawning habitat, according to CDFW (2020). The Columbian black-tailed deer, one of six subspecies of black-tailed deer in California, is recognized by black-tipped tail and large, pointy ears. Fawns are usually born in late spring/early summer in dense forests and shrublands, including riparian and mountain habitats, with abundant forage and water nearby. Within the Project Site, a total of 1,217.5 acres of forest/shrub habitat is present within forests/woodlands, chaparral, and shrublands (Table 3.4-1). Deer fawning habitat is present within the Project Site.

Bats

Seventeen bat species have the potential to occur within the Project Site; none are federally or state listed, and five are considered California SSC. Fourteen of the seventeen species have been acoustically detected within the Project (Appendix C6). Of these fourteen species, two species, the spotted bat (*Euderma maculatum*) and the western mastiff bat (*Eumops perotis*), are California SSC. A full list of bat species with potential to occur within the study area can be found in Appendix C6.

Bat fatality rates documented at nearby wind facilities can provide regional context for identifying and mitigating impacts. The Hatchet Ridge Wind Project, which has been in operation since 2010 and is located approximately 1 mile from the Project Site, has documented bat fatality rates for the first three years of operations (i.e., between November 18, 2010 and December 13, 2013) using standardized carcass searches, including searcher efficiency and carcass persistence trials to adjust for inherent biases in estimating Project-related fatality rates (Tetra Tech, 2014). Over the three years of monitoring, a total of 63 bat fatalities were found from four species (silver-haired, Brazilian free-tailed, hoary, and big brown). Estimated annual bat fatality rates ranged from 5.13 to 12.02 bats/turbine, of predominantly hoary, silver-haired, and Mexican free-tailed during their late summer/fall migration period (Tetra Tech, 2014). Rates were highest in

summer (July–September) and predominantly composed of hoary bats, silver-haired bats, and Mexican free-tailed bats. These three species are consistent with the species most commonly detected during the bat acoustic surveys conducted for this Project (Appendix C6). Further, the timing of peak fatalities at the Hatchet Ridge Wind Project aligns with peak activity rates documented at the Project Site.

Pallid Bat

The pallid bat (*Antrozous pallidus*) hunts on and near the ground: approximately 10-20 feet (3-6 meters) off the ground. This opportunistic foraging bat is a generalist, preying on myriad insects like arthropods, whether prey is flying or stationary. They may echolocate while flying, but generally use passive acoustic cues to locate prey.

Pacific Townsend's Big-eared Bat

The Pacific Townsend's big-eared bat (*Corynorhinus townsendii*) occupies myriad habitats up to 3,000 feet in elevation. Distribution is strongly correlated with the availability of caves and cave-like roosting habitat, including abandoned mines. Roost site use varies within seasons and among years. Both maternity and winter hibernating colonies vary in size from a few individuals to colonies of several hundred, with wintering groups composed of both sexes. *C. townsendii* forages in edge habitats preferably along streams and around and in a variety of wooded habitats and can cover large distances while foraging.

Spotted Bat

The spotted bat (*Euderma maculatum*) is a solitary species that infrequently will roost or hibernate in small groups. It is found to nearly 9,000 feet in elevation and prefers to inhabit areas of rock cliff and canyons, roosting in highly fractured rock crevices. During summer, bats may travel from low- to high-elevation feeding areas and return prior to dawn. *E. maculatum* is capable of long distance and rapid flight, and foraging ranges can be large. Individuals forage alone about 6.6-164 feet above ground.

Western Red Bat

The western red bat (*Lasiurus blossevillii*) is broadly distributed through much of the western United States. Generally solitary, this species is highly migratory, moving in groups and loosely grouping together to forage in summer. It roosts predominantly in the foliage of trees or shrubs. Little is known about their winter behavior. Roost characteristics are specific: hidden from view, opening beneath to allow bats to drop into flight, dark, sheltered from elements, and generally on south or southwest side of a tree. Prey includes large, nocturnal, winged insects like moths, leafhoppers, and flies; this species forages on the wing and around artificial nighttime lights.

Western Mastiff Bat

The western mastiff bat (*Eumops perotis*) is colonial bat species that occurs from western Texas to parts of southern California, and most recently in northern California to within a few miles of the Oregon border. In California, it was previously thought that this species occurs only to 1,230 feet (375 m) elevation, however, this species roosts up to 4,593 feet (1,400 m) and can forage up to 8,858 feet (2,700 m). This bat species has limited maneuverability in flight. The

distribution of *E. perotis* likely is present only where there are significant rock features offering suitable roosting habitat. It may be found in broad, open habitats, including desert scrub, chaparral, oak woodland, grasslands, and high elevation meadows of mixed conifer forests. This bat requires open, unobstructed waterways for drinking, and drought conditions can impact the species.

Hoary Bat

A migratory species, the hoary bat (*Lasiurus cinereus*) is the most widespread of all North American bats. This common, solitary species winters along the California coast and in southern California, breeding inland and north of the winter range. Habitats suitable for roosting include woodlands and forests with medium-to-large trees and dense foliage. Hoary bats prefer open habitats or habitat mosaics with access to trees for cover, and open areas or habitat edges for feeding. They have a strong foraging preference for moths, although various flying insects are also taken (Zeiner and Laudenslayer 1990). This species is documented on the Project site and at the nearby Hatchet Ridge Wind Project (Appendix C6).

Special-Status Plants

Special-status plants include any of the following:

1. Listed or proposed for listing as threatened or endangered under the FESA or candidates for possible future listing as threatened or endangered under FESA (50 C.F.R. §17.12).
2. Listed or candidates for listing by the State of California as threatened or endangered under CESA (Fish and Game Code §2050 et seq.).
3. Listed as rare under the California Native Plant Protection Act (CNPPA), (Fish and Game Code §1900 et seq.). A plant is rare when, although not presently threatened with extinction, the species, subspecies, or variety is found in such small numbers throughout its range that it may be endangered if its environment worsens (Fish and Game Code §1901).
4. Meets the definition of rare or endangered under CEQA Guidelines section 15380, subdivisions (b) and (d), including:
    a. Plants considered by CDFW to be "rare, threatened or endangered in California, including plants tracked by the California Natural Diversity Database (CNDDB) or designated as California Native Plant Society Rare Plant State Rank (CRPR) 1 or 2.
    b. Plants that may warrant consideration based on declining trends, recent taxonomic information, or other factors, which could include plants tracked by the CNDDB and California Native Plant Society as CRPR 3 or 4.
5. Locally significant plants, those that are not rare from a statewide perspective but are rare or uncommon locally within a county or region (CEQA Guidelines §15125(c)), or designated as significant in local or regional plans, policies or ordinances.

The California Native Plant Society has identified five categories of California Rare Plant Ranks (CRPR):

- List 1A—Plants presumed to be extinct in California

- List 1B—Plant species considered rare, threatened, or endangered in California and elsewhere
- List 2—Plant species considered rare, threatened, or endangered in California but more common elsewhere
- List 3—Plants about which more information is needed (a review list)
- List 4—plants of limited distribution (a watch list)

Each CRPR category may include an extension indicating the level of endangerment in California:

- 1—Seriously endangered in California (more than 80 percent of occurrences are threatened and/or high degree and immediacy of threat)
- 2—Fairly endangered in California (20–80 percent of occurrences are threatened)
- 3—Not very endangered in California

CDFW recommends and local governments may require that CEQA review of proposed projects address plants on Lists 1A, 1B, and 2.

No federally listed or candidate plant species are known to occur within the Project Site or vicinity. Based on data from the California Native Plant Society, 191 plant species that occur in Shasta County are considered sensitive. The California Natural Diversity Database (CNDDB) list of special-status plants and plant communities within ten miles of the Project and the California Native Plant Society Inventory of Rare and Endangered Plants list for Shasta County of special-status plant species and sensitive natural vegetation communities were used to identify rare plants with potential to occur in the Project Site. Two federally listed plant species were identified as having potential to occur within the Project Site: Greene's tuctoria (*Tuctoria greenei*) and slender Orcutt grass (*Orcuttia tenuis*; Table 3.5-5). However, based on the absence of vernal pools and open grasslands within the Project Site, these species are unlikely to occur. Federally designated critical habitat for slender Orcutt grass is located approximately 6.0 miles (9.7 km) north of the Project Site.

Four state-level sensitive plants (California rare plant rankings) have been documented within the vicinity of the Project Site (Appendix C3): Butte County morning-glory (*Calystegia atriplicifolia* ssp. *buttensis*), rattlesnake fern (*Botrypus virginianus*), northern clarkia (*Clarkia borealis* ssp. *borealis*), and English Peak greenbriar (*Smilax jamesii*).

Rare plant surveys were conducted in 2018 and 2019 (Appendix C3a, Appendix C3b). Rare plant surveys covered all proposed development corridors throughout the Project Site; however, approximately 800 acres of the Project Site were not surveyed due to modifications to the Project Site that occurred following the 2019 survey. No special-status plants were documented during the rare plant surveys. There is a high level of disturbance to natural vegetation communities within the Project Site due to continued logging operations and the 1992 Fountain Fire, which burned lands surrounding and throughout the central area of the Project site. Based on the negative survey results and current land use activities on the site, occurrence of special-status plants is not expected in the areas which were not included in the 2018 and 2019 surveys; however, this

conclusion remains to be verified. For this analysis, special-status plants (FESA, CESA, CNPPA, CNDDB CRPR 1 or 2) not detected on the Project Site during rare plant surveys are presumed absent. Rare plants were considered in the focused assessments (Appendix C3a, Appendix C3b). Per CDFW protocol, rare plant surveys are typically valid for a period of five years from the date conducted.

3.4.1.3 Regulatory Setting

Biological resources in California are protected and regulated by a variety of laws, regulations, plans and policies administered by federal, state, and local agencies. This section summarizes the biological resource-related agencies, regulations, and policies relevant to the Project and alternatives.

Federal

Federal Endangered Species Act

The Secretary of the Interior (represented by the USFWS) and the Secretary of Commerce (represented by NOAA Fisheries) oversee the federal Endangered Species Act (FESA). The USFWS implements and enforces FESA for terrestrial species; NOAA Fisheries implements and enforces it for aquatic and anadromous species. For purposes of this analysis, the USFWS is the oversight agency. Section 7 of the FESA mandates that all federal agencies consult with the USFWS to ensure that federal agencies actions do not jeopardize the continued existence of a listed species or destroy or adversely modify critical habitat for listed species. The federal agency is required to consult with the USFWS if it determines its action may affect a listed species or critical habitat will occur in association with its action(s). The FESA prohibits the unlawful "take"[2] of any fish or wildlife species listed as threatened or endangered, including the destruction of habitat that could hinder species recovery.

Under Section 9 of the FESA, the take prohibition applies only to wildlife and fish species. However, Section 9 does prohibit the removal, possession, damage, or destruction of any endangered plant from federal land. Section 9 also prohibits acts to remove, cut, dig up, damage, or destroy an endangered plant species in non-federal areas in knowing violation of any state law or in the course of criminal trespass. Candidate species and species that are proposed or under petition for listing receive no protection under Section 9 of the FESA.

Section 10 of the FESA requires the issuance of an "incidental take" permit before any public or private action may be taken that would potentially harm, harass, injure, kill, capture, collect, or otherwise hurt (i.e., take) any individual of an endangered or threatened species. The permit requires preparation and implementation of a habitat conservation plan that would offset the take of individuals that may occur, incidental to implementation of the project by providing for the overall preservation of the affected species through specific mitigation measures.

[2] Take is defined as harassing, harming, pursuing, hunting, shooting, wounding, killing, trapping, capturing, collecting, or attempting to engage in any such conduct.

Under the FESA, the USFWS designates critical habitat for listed species. Critical habitat designations are specific areas within a geographic region that are occupied by a species and determined to be critical to its survival in accordance with FESA. Federal entities issuing permits or acting as a lead agency must show that their actions do not adversely modify the critical habitat to the extent that it impedes the recovery of the species. Within designated critical habitat, USFWS protects habitat that provides the primary constituent elements (PCEs) for survival of the listed species. PCEs are the physical and biological functions considered essential to species conservation that require special management considerations or protection.

Federal Migratory Bird Treaty Act

The federal Migratory Bird Treaty Act (MBTA) (16 U.S.C. §703 et seq.) is the domestic law that affirms and implements a commitment by the United States for the protection of shared migratory bird resources. Except as permitted by regulations, the MBTA makes it unlawful to intentionally pursue, hunt, take, capture, or kill migratory birds anywhere in the United States. The law also applies to the intentional disturbance and removal of nests occupied by migratory birds or their eggs during the breeding season. In December 2017, the U.S. Department of the Interior issued memorandum M-37050, which redefined “incidental take” under the MBTA such that, “the MBTA's prohibition on pursuing, hunting, taking, capturing, killing, or attempting to do the same applies only to direct and affirmative purposeful actions that reduce migratory birds, their eggs, or their nests, by killing or capturing, to human control.” The current interpretation of the MBTA’s definition of “take” does not prohibit or penalize take of migratory birds that results from actions that are not intentional.

Bald and Golden Eagle Protection Act

The Bald and Golden Eagle Protection Act (16 U.S.C. §§668-668c) makes it illegal to trade in any bald eagle or golden eagle or parts thereof. The Act provides criminal penalties for persons who "take, possess, sell, purchase, barter, offer to sell, purchase or barter, transport, export or import, at any time or any manner, any bald eagle ... [or any golden eagle], alive or dead, or any part, nest, or egg thereof." The Act defines "take" as "pursue, shoot, shoot at, poison, wound, kill, capture, trap, collect, molest or disturb." In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

State

California Endangered Species Act

The California Endangered Species Act (CESA) prohibits the take of endangered and threatened species. Habitat destruction is not included in the State’s definition of take. Section 2090 of CESA requires State agencies to comply with endangered species protection and recovery and to promote conservation of these species. CDFW administers the act and authorizes take through Section 2081 agreements (except for designated “fully protected species”).

State-listed plants are protected mainly in cases where State agencies are involved in projects under CEQA. In this case, plants listed as rare under the California Native Plant Protection Act are not protected under CESA but can be protected under CEQA.

California Fully Protected Species (Fish and Game Code Sections 3511, 4700, 5050 and 5515) and Species of Special Concern

The classification of "fully protected" was CDFW's initial effort to identify and provide additional protection to those animals that were rare or faced possible extinction. Lists were created for fish, amphibian and reptiles, birds, and mammals. Most of the species on these lists have subsequently been listed under CESA and/or FESA. The California Fish and Game Code sections (fish at Section 5515, amphibians and reptiles at Section 5050, birds at Section 3511, and mammals at Section 4700) dealing with "fully protected" species states that these species "…may not be taken or possessed at any time and no provision of this code or any other law shall be construed to authorize the issuance of permits or licenses to take any fully protected species," although take may be authorized for necessary scientific research. This language makes the "fully protected" designation the strongest and most restrictive regarding the "take" of these species. In 2003, the code sections dealing with fully protected species were amended to allow CDFW to authorize take resulting from recovery activities for State-listed species.

California SSC are animals not listed under the FESA or CESA, but are nonetheless of concern because they are declining at a rate that could result in listing or historically occurred in low numbers and known threats to persistence currently exist. This designation is intended to result in special consideration for these animals by CDFW, land managers, consulting biologists and others, and is intended to focus attention on the species to help avert the need for costly listing under FESA and CESA and cumbersome recovery efforts that might ultimately be required. This designation also is intended to stimulate collection of additional information on the biology, distribution, and status of poorly known at-risk species, and focus research and management attention on them. Although these species generally have no special legal status, they are given special consideration in the CEQA process and are analyzed along with listed species in the CEQA Appendix G checklist.

Protection for rare plant species under CESA is afforded by the California Native Plant Protection Act (NPPA) of 1977 (Fish and Game Code §§1900-1913), which prohibits the importation of rare and endangered plants into California, take of rare and endangered plants, and sales of rare and endangered plants. The California Native Plant Society also identifies rare or endangered plants and ranks their rarity as 1A, 1B, 2, 3, and 4 species. Plant species with a California Rare Plant Rank 1A, 1B, or 2 are considered to meet CEQA significance criteria and Fish and Game Code sections 1901, 2062 and 2067 criteria as rare or endangered species.

California Fish and Game Code 3503

Fish and Game Code Section 3503 establishes that it is unlawful to take, possess, or needlessly destroy the nest or eggs of any bird, except as otherwise provided by this code or any regulation made pursuant thereto. In addition, birds of prey are protected under Fish and Game Code Section 3503.5, which states that it is "unlawful to take, possess, or destroy any birds in the order Falconiformes (diurnal birds of prey) or Strigiformes (owls) or to take, possess, or destroy the

nest or eggs of any such bird except as otherwise provided by this code or any regulation adopted pursuant thereto." Disturbance during the breeding season could result in the incidental loss of fertile eggs or nestlings or otherwise lead to nest abandonment. CDFW considers any disturbance that causes nest abandonment and/or loss of reproductive effort to be "taking."

California Department of Fish and Game Code Sections 1600-1616

CDFW regulates activities that would interfere with the natural flow of, or substantially alter, the channel, bed, or bank of a lake, river, or stream. These activities are regulated under Fish and Game Code Sections 1600 to 1616. Requirements to protect the integrity of biological resources and water quality are often conditions of Streambed Alteration Agreements. Requirements may include avoidance or minimization of the use of heavy equipment, limitations on work periods to avoid impacts on wildlife and fisheries resources, and measures to restore degraded sites or compensate for permanent habitat losses. A Streambed Alteration Agreement may also be required by CDFW for construction activities that have the potential to result in an accidental release of debris, waste or other material into a lake, river or stream.

Porter Cologne Act and Responsibilities of the State Water Resources Control Board under the Clean Water Act

The Clean Water Act requires that the discharge of dredged or fill material into waters of the U.S. does not violate state water quality standards. Applicants for Section 404 or Section 10 permits must obtain a Section 401 water quality certification from the State Water Resources Control Board.

Pursuant to the Porter-Cologne Act, each of California's nine Regional Water Quality Control Boards (RWQCB) must prepare and periodically update basin plans that set forth water quality standards for surface and groundwater, as well as actions to control nonpoint and point sources of pollution to achieve and maintain these standards. Basin plans offer an opportunity to achieve wetlands protection based on water quality standards.

Z'Berg-Nejedly Forest Practice Act

The Z'Berg-Nejedly Forest Practice Act of 1973 (Public Resources Code §§4511-4360.2) and its implementing regulations, the Forest Practice Rules (14 Cal. Code Regs. §895 et seq.), govern the management of privately owned forestlands in California, including with respect to biological resources. See, for example:

- Rule 939.2 General Protection of Nest Sites (14 Cal. Code Regs. §939.2)
- Rule 939.3 Specific Requirements for Protection of Nest Sites (14 Cal. Code Regs. §939.3)
- Rule 939.4 Non-listed Species (14 Cal. Code Regs. §939.4)
- Rule 939.9 Northern Spotted Owl (14 Cal. Code Regs. §939.9)
- Rule 939.12 Sensitive Species Classification (14 Cal. Code Regs. §939.12)

Local

Shasta County General Plan

The Fish and Wildlife Habitat Element (6.7) of the Shasta County General Plan contains policies (summarized below) to guide County planning for biological resource conservation and management (Shasta County, 2004):

Policy FW-b: Recognition that classification of some fish, wildlife, and vegetation resources designated and used as Timberlands in most cases protects habitat resources. However, if there is a conflict, the timber land use classifications shall prevail in a manner consistent with State and Federal laws.

Policy FW-c: Projects that contain or may impact endangered and/or threatened plant or animal species, as officially designated by the California Fish and Game Commission and/or the USFWS, shall be designed or conditioned to avoid any net adverse project impacts on those species.

Policy FW-d: The significant river and creekside corridors of Shasta County shall be designated on the General Plan maps. The primary purpose of this designation is to protect the riparian habitats from development and from adverse impacts from conflicting resources uses. Riparian habitat protection along the significant river and creekside corridors, as designated on the plan maps shall be achieved, where appropriate, by the following measures:

- regulation of vegetation removal.
- design of grading and road construction to restrict sediment input to all streams.
- establishment of a development set-back.
- the siting of structures, including clustering.

Policy FW-f: The County should encourage and support efforts by State and Federal agencies that implement the Upper Sacramento River Fisheries and Riparian Habitat Management Plan.

Oak Woodland Voluntary Management Guidelines

The County adopted these voluntary guidelines in 1995 to encourage retention of an average canopy of 30 percent or more when harvesting oaks, including trees of a variety of species, ages, and conditions, as well as brush piles, hollow trees and other habitat components. The guidelines recommend the clustering of buildings, protection of residuals, and replacement of removed trees when building occurs among oaks. Development, including roads, cuts and fills, foundations and septic systems should be carefully planned to avoid impacts. The guidelines also recommend landowners consider replacing trees unavoidably removed during construction, and contact a specialist for help maintaining large or specimen trees. Because oak woodland habitat is present within the Project Site, these guidelines are considered in the analysis.

3.4.2 Significance Criteria

A project would result in a significant impact to Biological Resources if it would:

a) Have a substantial adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS;

b) Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS;

c) Have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means; or

d) Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

CEQA Guidelines Appendix G Section IV also suggests consideration of local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance, and any adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan covering an area that would be affected by a proposed project. See Section 3.4.1, *Environmental Topics Removed from Consideration*.

3.4.3 Direct and Indirect Effects

3.4.3.1 Methodology

The information and analysis presented below are based in part on data provided in Appendix C, *Biological Resources*. The County independently reviewed this and other materials prepared by or on behalf of the Applicant and determined them to be suitable for reliance on (in combination with other materials included in the formal record) in the preparation of this Draft EIR. Potential impacts to biological resources were analyzed by:

1. reviewing species-specific studies and surveys within the Project Site to determine the likelihood of a species' presence;

2. overlaying the proposed Project footprint, including permanent and temporary disturbance areas, with maps of biological resources in the Project Site using GIS;

3. calculating the acres of each habitat type that would be removed or disturbed using GIS;

4. distinguishing between direct impacts, which would include construction of wind turbines, roads, and facilities, and indirect impacts that would include habitat disturbance, operation of the Project, and increased human activities during Project construction and operation;

5. assessing the risk of bird and bat collision with wind turbines and power lines based on analysis of this Project and studies from other wind energy facilities, including the Hatchet Ridge Wind Project, and;

6. determining whether an effect on a candidate, sensitive, or special-status species would be substantial based on whether it could result in an adverse effect on the species' population.

The analysis distinguished between permanent impacts (long-term and built environment) and temporary impacts (temporary and short- or limited-term) and addresses the three general phases of the Project as described in Chapter 2, *Description of the Project and Alternatives*:

1. site preparation and construction;
2. operations and maintenance; and
3. decommissioning and site restoration.

Construction-Related Impacts

Habitat loss and degradation (including noise and increased human activity) are the primary impacts on biological resources that would result from the construction of the Project. Loss of habitat would result from construction of all Project components. Permanent habitat loss would occur in the permanent footprint of the Project components, while temporary habitat loss would occur during construction and while habitats are restored and returned to their preconstruction condition. Temporary habitat degradation would occur due to increased noise and human activity. Additional habitat degradation would result from conversion of habitats that would not be restored or allowed to return to their preconstruction state after construction until the Project is decommissioned.

Operational Impacts

Operational impacts from the Project would include collisions of birds and bats with wind turbines while passing through the rotor swept areas, and barotrauma for bats. Operational impacts on birds may also result from collisions with the overhead electric transmission lines. The Project is designed such that all energized Project components, including the above-ground collection lines, would be constructed in accordance with the current suggested practices of the Avian Power Line Interaction Committee (APLIC, 2006, 2012).[3]

The use of vehicles to maintain operations, including turbine maintenance and repair, and defensive space vegetation clearing may result in collisions with common terrestrial wildlife species.

Decommissioning and Site Reclamation

Decommissioning of the Project would include dismantling wind turbine components facilities, excavation and removal of turbine foundations to a depth of approximately 3 feet below grade, natural revegetation of unused roads, recontouring and revegetation of the site. As discussed in Section 2.4.7, the Applicant proposes to return the Project Site to conditions similar to pre-construction conditions, including by replanting with commercial tree species or other vegetative cover. For purposes of analysis, this EIR assumes that the restoration plan included in the Draft

[3] APLIC publications offer design suggestions including pole design, electrical configuration and the use of insulation materials to reduce the risk of avian electrocutions.

Decommissioning Plan would include a detailed description of pre-construction conditions, and that the Final Decommissioning Plan would comply with the timber stocking standards and related requirements of the Forest Practice Act and Forest Practice Rules. Further, the Draft Decommissioning Plan would detail how facilities and infrastructure would be removed, which facilities would be retained, and include standards for re-establishment and monitoring of vegetation. The timeline for decommissioning is expected to be 18 to 24 months.

3.4.3.2 Direct and Indirect Effects of the Project

a) Whether the Project would have a substantial adverse impact, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special-status species in local or regional plans, policies, or regulations, or by CDFW or USFWS.

Special-Status Plant Species

Impact 3.4-1: Construction of the Project could, unless mitigated, cause a significant impact to special-status plant species. (*Less than Significant with Mitigation Incorporated*)

As stated in Section 3.4.1.2, no special-status plants were documented in the Project Site during rare plant surveys in 2018 and 2019. Rare plant surveys in forested areas are typically valid for up to 5-years per CDFW protocol. Based on the observed absence of special-status plants, no direct impacts on special-status plants are anticipated within the surveyed areas of the Project Site, provided vegetation clearing and ground disturbance activities occur within 5 years of survey completion.

Approximately 800 acres of the Project Site were not surveyed for special-status plants due to changes in the layout of the Project, which occurred after surveys were completed. If construction activities such as road development, turbine installation, or other ground disturbance occur in the 800-acres of unsurveyed area direct impacts on special-status plants such as removal or crushing could result. Because, special-status plants often occur in isolated non-contiguous populations, damage or destruction of special-status plants would be a significant impact. Implementation of Mitigation Measure 3.4-1 below, Avoid and Minimize Construction Impacts on Special-Status Plants would reduce this impact to a less-than-significant level by conducting rare plant surveys prior to construction, and avoiding or relocating any rare plants found.

Mitigation Measure 3.4-1: Avoid and Minimize Construction Impacts on Special-Status Plants

To prevent adverse impacts to special-status plants, the Project Applicant shall implement the following measures if construction activities are to occur in the area not yet surveyed, or if vegetation removal and ground disturbing construction activities have not been completed within 5 years of the completion of rare plant surveys:

a) A qualified biologist shall conduct a pre-construction survey for special-status plant species with the potential to occur within the unsurveyed area, or other areas if 5 years have passed since completion of rare plant surveys; or as otherwise approved by CDFW. The survey shall follow the procedures outlined in the CDFW (2018) rare plant survey protocol.

b) If special-status plants are found to be present, plant populations shall be avoided using an appropriate (e.g., 20-foot or greater) buffer for the subject population during construction. The buffer shall be staked, roped, and/or fenced off so as to be readily identifiable by construction workers as a buffer area to be avoided.

c) Where special-status plant avoidance is not feasible, the applicant shall mitigate for the loss of plants through the implementation of the following: A qualified ecologist shall develop and implement a restoration and mitigation plan according to CDFW guidelines and in coordination with CDFW. At a minimum, the plan shall include collection of reproductive structures or plant salvage from affected plants, a full description of microhabitat conditions necessary for each affected species, seed germination requirements, restoration techniques for temporarily disturbed occurrences, assessments of potential transplant and enhancement sites, success and performance criteria (e.g., greater than 1:1 replacement of individual plants or the population area), include a minimum 3-year monitoring program, as well as measures to ensure long-term sustainability such as weeding or supplemental water.

d) Survey results shall be provided to the Shasta County Department of Resource Management, Planning Division and CDFW at least 14 days in advance of the initiation of construction activities within the area(s) surveyed. The Shasta County Department of Resource Management, Planning Division shall, in coordination with CDFW, determine whether or not the survey(s) were conducted in accordance with CDFW plant survey protocol and measures b) and/or c) are to be implemented. Construction shall not begin in the surveyed area until the Shasta County Department of Resource Management, Planning Division has confirmed that the survey(s) were conducted in accordance with the protocol and, if necessary, that measures 3.4-1b and/or 3.4-1c have been implemented.

Significance after Mitigation: Less than significant.

Bald and Golden Eagles

Impact 3.4-2: Construction of the Project could, unless mitigated, cause a significant impact on nesting bald and golden eagles. (*Less than Significant with Mitigation Incorporated*)

Nesting Disturbance

Aerial nest surveys conducted in 2017 found 11 occupied bald eagle nests within 10 miles of the project (Appendix C9). Most of these nests were located along or near the Pit River, north of the Project Site and between 4 to 8 miles from the project boundary. The nearest bald eagle nest was found on Lake Margaret, a small reservoir 2.9 miles east of the Project Site boundary (Appendix C9). Over 20 bald eagles were recorded in avian use surveys (Appendix C4).

No golden eagle nests were found during two years of aerial nest searches, and avian use surveys documented only three observations of golden eagles in 914 hours of survey effort over two years (Appendix C4). Typical golden eagle nesting habitat, such as rocky outcroppings or exposed cliffs, may be found in the surrounding region, but is generally absent from the Project Site. The

California Natural Diversity Database identifies three historic golden eagle nests within 10 miles of the project boundary.

Eagles are state fully protected species and are protected under the Bald and Golden Eagle Protection Act in response to declining populations, disturbance of nesting eagles could result in an adverse effect on local bald and/or golden eagle populations and would therefore be substantial. If nests are present within 2 miles of the Project Site, the highest risk to nesting bald and golden eagles during construction activity is disturbance from noise and human activity. Noise from equipment and human disturbance may cause eagles to leave active nests, and repeated or severe disturbance may result in a failed nest attempt or complete nest abandonment, which would be a significant impact. Disturbance from construction could be minimized by measures such as surveying and locating occupied eagle nests, choosing an appropriate time of year for construction phases, establishing buffer distances from active nests according to USFWS recommendations, and monitoring for compliance and effectiveness. The implementation of Mitigation Measure 3.4-2 would reduce the impacts on nesting bald and golden eagles from construction disturbance to less than significant.

Nesting and Foraging Habitat

Open habitat types that could be utilized by foraging golden eagles comprise a low proportion of the mostly forested landscape: out of 4,464 acres within the Project Site, montane meadow accounts for 1.4 acres (<0.1 percent), mixed chaparral 76.2 acres (1.7 percent), riparian scrub 80.0 acres (1.8 percent), and mixed riparian forest 27.2 acres (0.6 percent). Additionally, bald eagles are not expected to use the Project Site landscape for foraging as surface waters within the Project Site tend to be intermittent in the winter months, and dry in the summer, depending on conditions for snow melt and winter rains. Because of the lack of suitable habitat, it remains unlikely that eagles would use the Project Site for nesting or foraging. Given the relatively low use of the Project Site by bald and golden eagles, and the low percentage of preferred habitat types within the Project boundary, permanent impacts from construction of the Project on bald and golden eagle nesting and foraging habitat would be less than significant.

Mitigation Measure 3.4-2: Avoid and minimize construction-related impacts to nesting eagles *(January 1 to August 31)*.

To prevent adverse impacts to nesting eagles, the Project Applicant shall implement the following measures if construction activities are to occur during the nesting season:

a) Conduct terrestrial preconstruction eagle nesting surveys of known previously active nest sites to determine whether eagles are actively nesting or maintaining territories within 2 miles of the Project construction boundary. Surveys will be designed and carried out by a qualified biologist with experience in the natural history and nesting behavior of eagles, following USFWS guidelines. Terrestrial surveys will include all suitable eagle nesting habitat within a 2-mile buffer surrounding the Project construction boundary, as accessible, and subsequent observations at known nests to assess territory occupancy and nesting activity by adult eagles.

b) Results of preconstruction eagle nesting surveys will be reported to the Shasta County Department of Resource Management, Planning Division, USFWS, and

CDFW by August 31 of the year in which the survey was conducted. The Shasta County Department of Resource Management, Planning Division shall, in coordination with resource agencies, determine whether or not the survey(s) were conducted in accordance with appropriate protocols and measures c) is to be implemented. Construction shall not begin in the surveyed area until the Shasta County Department of Resource Management, Planning Division has confirmed that the survey(s) were conducted in accordance with appropriate protocols and, if necessary, that measure 3.4-2c has been implemented.

c) If surveys document active eagle nests within the 2-mile survey buffer, the Project Applicant will coordinate with the County, USFWS and CDFW to define and implement recommended protective measures. Typical measures for working within 2 miles of eagle nests are to establish construction buffers (e.g., with flagging, rope, signage, or other similar barriers) in accordance with USFWS recommendations (National Bald Eagle Management Guidelines, 2007; Golden Eagle, 2013) for specific activities (e.g., vehicular traffic, construction work, etc.); and may be adjusted downward based on site-specific conditions following coordination with the USFWS Migratory Bird Program and CDFW.

Significance after Mitigation: Less than significant.

Impact 3.4-3: Operation of the Project could, unless mitigated, result in significant adverse impacts to or direct mortality of bald and golden eagles (*Significant and Unavoidable*)

Operation of the Project could have direct impacts on bald and golden eagles through collision with power lines or operating wind turbine generators, or electrocution from energized components. The most directly relevant data for an assessment of the Project's potential risk to eagles comes from the nearby Hatchet Ridge Wind Project, specifically its two-year preconstruction avian use survey reports and three-year post-construction mortality monitoring report (Tetra Tech, 2014, 2013, 2012). Both the Hatchet Ridge project and the proposed Project are somewhat unique among western wind projects in their high percentage of forested landscape, however, the Project turbines would be 62 percent taller with 70 percent larger blade diameters than the Hatchet Ridge project. Even with these design differences, the Hatchet Ridge project's study results provide the best available data on potential for eagle mortality to occur.

The Hatchet Ridge Wind Project EIR (Shasta County, 2007) identified the potential for significant and unavoidable impacts on bald eagles, as well as special-status raptors, greater sandhill cranes, and other avian species; however, post-construction avian fatality monitoring did not identify any bald or golden eagle mortalities from project operation (Tetra Tech, 2014). Avian use studies of the Leasehold Area for this Project (Appendix C9) found lower use of the area by bald eagles, and comparable use by golden eagles, when compared to preconstruction surveys at the Hatchet Ridge project site. These patterns were consistent across seasons. However, there is uncertainty that there may be relatively greater impacts on bald or golden eagles due to the Project's substantially taller turbines. For comparison, at Hatchet Ridge, each tower has a maximum total tip height of 420 feet, with a rotor diameter between 253 and 312 feet and a wind-swept area up to 980 sq. ft. (Shasta County, 2007). The Project has total tip height of up to

679 feet, a rotor diameter up to 433 feet, and a wind-swept area of up to 1,360 sq. ft. (Figure 2-4a). Because the wind-swept area of the Project is larger than Hatchet Ridge, and the blades cover a greater area, the relative risk to eagles is considered incrementally greater for the Project. Given the close proximity of the Hatchet Ridge project site to the Project Site, and the similar siting of the two projects outside of preferred eagle foraging habitat, the risk of impacts is anticipated to be similarly low between the two projects. Thus, while the risk to eagles from operation of the proposed Fountain Wind facility is relatively low (due to the limited use of the area by eagles), there remains potential for eagle injury and death due to collisions with turbines. As stated previously, eagles are CDFW fully protected species and are protected under the Bald and Golden Eagle Protection Act in response to declining populations, collision related injury or death of eagles could result in an adverse effect on local bald and/or golden eagle populations and would therefore be substantial. Implementation of Mitigation Measures 3.4-3a, 3.4-3b and 3.4-3c would reduce this potential impact by identifying potentially hazardous situations on the Project Site for bald and golden eagles, providing coordination with the USFWS, providing active steps to reduce eagle hazards, and providing compensatory mitigation, if needed, to address the loss of eagles consistent with federal guidance. However, due to the uncertainty related to the larger turbine size and wind-swept area compared to the Hatchet Ridge project, the potential impact on bald and golden eagles would remain significant and unavoidable. Note that these measures additionally include provisions to protect other raptors and bats, which are discussed later in this section, to avoid redundancy in the document.

Mitigation Measure 3.4-3a: Avoid and minimize operational impacts on avian and bat species.[4]

The Project Applicant will avoid and minimize operational impacts on eagles, other raptors, and bats by enacting the following mitigation measures:

a) Discourage raptor use of immediate vicinity of wind turbine generators by taking steps to reduce prey species' numbers, such as minimizing creation of prey habitat such as rock piles.

b) Follow APLIC (2006, 2012) guidance for all energized Project components to minimize electrocution or collision with transmission lines.

c) Follow *Land-Based Wind Energy Guidelines* (USFWS, 2012) for turbine design and best management practices that help to minimize eagle mortality and eliminate potential raptor perches; avoid guy wires on meteorological towers where possible.

d) Prior to Project construction, the Applicant will coordinate with USFWS regarding potential impacts to eagles and demonstrate the Projects' compliance with the Bald and Golden Eagle Protection Act and the USFWS Eagle Conservation Plan Guidance (2013).

e) All Project staff responsible for operations will be trained in reporting avian and bat wildlife fatalities, including those of bald and golden eagles, other raptors, and bats encountered during turbine maintenance and other regular activities on site.

[4] Mitigation measure 3.4-3a encompasses more species than just eagles. This is to avoid redundancy within the document, and the measure is referred to as a means of reducing other impacts throughout the document.

A protocol for project staff will be developed in coordination with CDFW and the County for appropriate handling and reporting fatalities.

Mitigation Measure 3.4-3b: Monitor avian and bat mortality rates during project operations.[5]

To accurately assess operational Project impacts on avian species, including bald eagle, golden eagle, other raptors, and bats, and ensure the effectiveness of avian protection measures, the applicant will design and implement a post-construction mortality monitoring (PCMM) study. The PCMM will include the following elements:

a) The duration of PCMM monitoring to assess ongoing impacts of operation will include post-construction monitoring for eagles, other raptors, and bats. The PCMM monitoring will commence immediately following the beginning of commercial operation and continue for three years following the incorporation of all planned turbines and power generation.

b) PCMM studies will be designed to meet a minimum overall detection probability for bald and golden eagles of 30 percent during the first three years of full operation. Additionally, the PCMM will include a mandatory incidental monitoring and reporting program for other raptors and bats for the life of the Project.

c) Searcher efficiency trials and carcass persistence trials using large raptor carcasses or an appropriate, commercially available proxy will be implemented and used to calculate overall detection probabilities of eagle carcasses. Carcasses of other birds and bats will also be collected and reported.

d) Monitoring will occur over all seasons of occupancy for the species being monitored.

e) Applicant will provide an annual report of PCMM findings to the Shasta County Department of Resource Management, Planning Division, CDFW, and the USFWS. If a bald or golden eagle, other raptors or bats are detected during PCMM, and detections indicate exceedance of the following thresholds, the Applicant and relevant agencies will develop a plan to mitigate the impacts per the *Land-Based Wind Energy Guidelines* (USFWS, 2012).[6]

    - Bald eagle – injury or mortality to one or more bald eagles in any given year.
    - Golden eagle – injury or mortality to one or more golden eagles in any given year.

5 Mitigation measure 3.4-3b encompasses more species than just eagles. This is to avoid redundancy within the document, and the measure is referred to as a means of reducing other impacts throughout the document.

6 Injury and mortality thresholds for bald eagle, golden eagle, and California spotted owl stated above were developed based on the low expectation for species mortality during project operations. For northern goshawk, this species is not listed and no California wind farm mortality has been identified in California. Because this species is unlikely to be encountered, a threshold of two individuals was adopted. For other raptors, the adopted threshold was based on the regional populations of Coopers hawk, sharp-shinned hawk, and northern harrier, which are fairly healthy. For most raptor species, mortality to migrating individuals is not anticipated. This assessment was based on focused baseline surveys of the Project area, monitoring findings from the Hatchet Ridge Wind Project, and coordination with raptor experts. For uncommon bat species with low population numbers, four WBWG high priority species are considered to have a low to moderate potential to occur and a threshold of three individuals per species was adopted based their rarity and low encounter numbers at the Hatchet Ridge Wind Project. For two WBWG medium species, a threshold of six bats was adopted based on the absence of habitat in the Project area (western mastiff bat) or the greater abundance of the species (hoary bat).

- Other raptors – injury or mortality to six or more individuals of any sensitive raptor species in any given year, except northern goshawk. For northern goshawk, injury or mortality to two or more individuals in any given year.

- Bats – injury or mortality to three or more bats of a single species identified as Western Bat Working Group (WBWG) high priority (red) species (i.e., pallid bat, Townsend's bat, spotted bat, western red, or western mastiff) in any given year; or injury or mortality to six or more bats of a single species identified as WBWG medium priority (yellow) species (i.e., hoary bat or spotted bat), in any given year.

The Applicant will implement minimization measures recommended by these agencies to limit mortality. Which may include operational modifications such as curtailment of turbine speed. The possible use of low-intensity ultraviolet light and ultrasonic deterrence systems to deter birds and bats from approaching rotating wind turbine blades may also be considered as warranted (AWWI, 2018).

Mitigation Measure 3.4-3c: Offset operational impacts on eagles through compensatory mitigation, if necessary.

a) If bald or golden eagle mortality occurs as a result of the Project, the Project Applicant will fund the retrofitting of electrical utility poles that pose a high risk of electrocution to eagles. Applicant will coordinate with the USFWS and follow the most current USFWS *Eagle Conservation Plan Guidance* (USFWS, 2013). If in coordination with USFWS an alternative compensatory mitigation measure is preferred to pole retrofitting, such alternative compensation measure (e.g., pole reframing or funding carcass removal from roadways) may be implemented.

b) Any compensatory mitigation must occur within the same Eagle Management Unit as the Project, and must be completed within one year of any instance of documented take.

c) Applicant will provide a report to the Shasta County Planning Department and USFWS documenting implementation of measures taken within one year of detection of the eagle take.

d) Annually and after collection of 3 years of post-construction monitoring data, the Shasta County Department of Resource Management's will review the data and, in coordination with the Project Applicant, USFWS and CDFW, will determine which, if any, specific wind turbines generate disproportionately high levels of avian (including eagle) mortalities (based on evidence of statistically significant higher levels of mortality relative to other Project wind turbines). If specific wind turbines are found to result in disproportionately high avian mortalities based on collected data, the Project Applicant shall coordinate with the County to evaluate any feasible measures that can be implemented to reduce or avoid mortalities at those specific wind turbines. Furthermore, if mortalities involve eagles, the County will consider additional measures, including but not limited to carcass removal from roadways or funding for the acquisition of conservation easements on habitat that would provide nesting, foraging, or roosting bald and/or golden eagle habitat.

e) If unauthorized take of a federal or state listed raptor occurs during project operation, the Project Applicant shall immediately notify the appropriate agency (CDFW and/or USFWS) by phone. The Applicant shall submit a written finding to the appropriate

agency and the County within two calendar days that describes the date, time, location, species and, if possible, cause of unauthorized take. The Applicant shall notify the County within three calendar days of the receipt of any USFWS and/or CDFW required or recommended actions resulting from the unauthorized take, including whether an incidental take permit and/or additional requirements is deemed necessary by either agency.

Significance after Mitigation: Due to the uncertainty of potentially increased impacts resulting from larger turbines and wind-swept area when compared to the Hatchet Ridge Wind Project, the impact after implementation of mitigation would be significant and unavoidable.

Impact 3.4-4: Decommissioning of the Project could result in adverse impacts to nesting bald and golden eagles. (*Less than Significant with Mitigation Incorporated*)

The anticipated operational lifespan of the Project is 40 years. Decommissioning of the Project and reclamation of the site is expected to have similar impacts on nesting bald and golden eagles as the construction phase, in terms of noise, disturbance, and equipment used, and would require similar mitigation. The implementation of Mitigation Measure 3.4-4 would reduce this potential impact to less than significant.

Mitigation Measure 3.4-4: Implement Mitigation Measure 3.4-2 (Avoid and minimize construction-related impacts to nesting eagles).

Significance after Mitigation: The implementation of this mitigation measure would reduce this potential impact to less than significant by identifying species presence and providing adequate buffers to avoid direct and indirect impacts to nesting birds.

California Spotted Owl

Impact 3.4-5: Construction, operation and decommissioning of the Project could result in adverse impacts to California spotted owls. (*Less than Significant Impact*)

Nesting and Roosting Habitat

The Project Site is located at edge of the geographic range of the California spotted owl and little high-quality nesting and roosting habitat is present within the Project Site (Appendix C11). The majority (about 75 percent) of the Project Site contains vegetation communities unsuitable, or of low suitability, for California spotted owl nesting (Appendix C11). Areas of the Project Site containing moderate to high suitability for nesting habitat are present only within the southeastern third of the Project Site, with approximately 945 acres classified as having moderate suitability for the species and 50 acres classified as having high suitability. These areas of predicted high suitability for nesting and roosting, are present in small, isolated patches in the Project Site which may limit the potential for these areas to support California spotted owl roosts or nests. Construction of roads and other facilities at the Project Site could remove, fragment, and modify

suitable California spotted owl habitat. As described in the focused California spotted owl assessment prepared for the Project (Appendix C11), although approximately 995 acres of moderate to high suitability CSO habitat occurs within the Project Site, only a portion of this area may need to be cleared for the construction and operation of the Project, since the Project Site includes the disturbance area plus a buffer. For this impact analysis purposes, it was assumed the entire 995 acres would be disturbed. However, because the amount of potential habitat to be cleared for the project is only a small portion of available habitat in the region, and is consistent with current land uses (timber harvest), the loss of this potential habitat is not likely to have a substantial effect on California spotted owl populations or habitat use in the region. Within this regional context, plus the lack of recent (since mid-1990's) California spotted owl detections in areas within or surrounding the Project Site (Appendix C11), indicates the Project's impact on California spotted owl nesting habitat would be less than significant.

Nesting Disturbance

If nesting California spotted owls are present in habitat areas at the time of construction, activities could disturb active nests during the 18- to 24-month construction period. Project construction noise and activities could increase stress levels in owls during daytime roosting/nesting periods, potentially leading to nest abandonment and reduced productivity caused by auditory and visual disturbances. These impacts could occur over two consecutive breeding seasons. Similar construction impacts could occur when the Project is decommissioned. Disturbance of nesting for up to two consecutive years, could adversely affect owl populations due to the small number of California spotted owls present in the region.

Although construction impacts to California spotted owl populations are estimated to be less than significant based on low habitat suitability in the Project area, there is a remaining low risk of nest disturbance if owls were to nest in the area. In an effort to further reduce potential effects on California spotted owl, the County may elect to include additional conservation measures identified below as a condition of permit approval.

Operational Effects

The Project Site has been used primarily for the management of timber production for decades along with its associated timber harvest activities. Timber management and harvest operations have recently been conducted primarily within the southern half of the site. Maintenance of the Project, which will involve episodic driving of project roads by maintenance personnel is not likely to result in vehicle collisions with California spotted owl, as maintenance occurs predominantly during daylight hours when owls are inactive. Additionally, Project maintenance activities will not incrementally increase existing vehicle driving and disturbance levels compared with timber operations.

California spotted owls could incur injury or death as a result of collisions with Project wind turbines during operation in areas where the wind turbine blade height overlaps with the height of the adjacent forest canopy. However, due to the low anticipated use of the Project Site by California spotted owls, the limited extent of mature, complex forest stands within and adjacent to the Project Site, the flight behavior of spotted owls, and the low number of collision fatalities of forest-dwelling owl species documented at wind energy facilities, potential impacts to spotted

owls resulting from collision with Project turbines is anticipated to be very low. As a result, operational impacts on California spotted owl would be less than significant.

Although operational impacts would be less than significant, there is a risk of collisions occurring if species use of the area by owls increases from observed levels, or the larger turbine result in increased collisions. In an effort to further reduce potential effects on California spotted owl, the County may elect to include additional conservation measures, as follows, as a condition of permit approval.

California Spotted Owl Conservation Measures:

Modification of EIR Mitigation Measures 3.4-3a (Avoid and minimize operational impacts on Avian and Bat species) and 3.4-3b (Monitor Avian and Bat Mortality Rates During Project Operations) to include California spotted owl would reduce effects by monitoring mortality rates during project operations and implementing agency-recommended minimization, in response to observed collision injuries or mortalities. Modification of Mitigation Measure 3.4-b (e) would include: if a California spotted owl are detected during PCMM, and detections indicate exceedance of the following threshold, the Project Applicant and relevant agencies will develop a plan to mitigate the impacts per the *Land-Based Wind Energy Guidelines* (USFWS, 2012)

- California spotted owl - injury or mortality to one or more owls in any given year; or three owls over three years.

Minimize construction disturbance to California spotted owl.

To avoid direct impacts to active California spotted owl nests, conduct one season of pre-construction surveys in potentially suitable moderate or high quality habitat areas. Alternatively, the Applicant may choose to assume occupancy in some areas based on the presence of suitable nesting, roosting, or foraging habitat in suitable habitat within the Project Site or within 0.25-mile of the Project roads and wind turbines, and adhere to the guidance and seasonal restrictions described below for operating in an "Un-surveyed Landscape." Also before decommissioning the Project, implement each of the mitigation measures outlined below.

1) ***Surveyed Landscape*** – If pre-construction surveys are completed or are current for the Project Site (based on surveys conducted by the Applicant or other data provided from other entities) and those surveys indicate that the suitable habitat at the site is considered to be occupied by California spotted owl:

    a) Do not conduct activities that result in loud and continuous noise levels above 90 decibels within 0.25 mile (or 1,320 feet) of a nest site between February 1 and July 9.

    b) Do not conduct any modification of suitable habitat within 0.25 mile (or 1,320 feet) of an active nest site between February 1 and September 15. Suitable habitat includes California spotted owl NRF habitat. Modification includes cutting and removal of large trees, down logs or snags. Tree or limb trimming or pruning, brush trimming or removal, and hazard tree felling may occur as long as the noise levels described above are not exceeded during the critical breeding period of February 1-July 9.

c) Do not conduct any smoke-generating activities within 0.25 mile (or 1,320 feet) of a nest site between February 1 and July 31.

2) ***Un-surveyed Landscape*** – If surveys have not been completed or cannot be done, assume occupancy in suitable habitat within the Project Site:

a) Do not conduct activities that result in loud and continuous noise above ambient levels above 90 decibels within 0.25 mile (or 1,320 feet) of un-surveyed suitable habitat between February 1 and July 9. Reduced buffers (e.g., 330 feet to 825 feet) may be appropriate based on the type and volume of anticipated noise, and if the Project Site has higher ambient noise levels. Nest buffer distances may be reviewed by a qualified biologist on a case-by-case basis in accordance with USFWS's *Estimating the Effects of Auditory and Visual Disturbance to Northern Spotted Owls and Marbled Murrelets in Northwestern California* (USFWS, 2006), and applying the methods to California spotted owl.

b) Do not conduct any modification of suitable habitat within 0.25 mile (or 1,320 feet) of un-surveyed suitable habitat between February 1 and September 15. Modification includes cutting and removal of large trees, down logs or snags. Tree or limb trimming or pruning, brush trimming or removal, and hazard tree felling may occur as long as the noise levels described above are not exceeded during the critical breeding period of February 1-July 9. Prior to the removal of any potential nesting and/or roosting trees, an experienced wildlife biologist will be consulted to assess the usage of these trees by California spotted owls.

Significance after Mitigation: Implementing these mitigation measures would reduce the impacts of construction noise and disturbance on California spotted owls during roosting or nesting periods and would minimize the risk of nest disturbance and increased stress levels that could adversely affect spotted owl behavior and activities.

Migratory and Resident Raptors (excluding Eagles)

Impact 3.4-6: Construction and decommissioning of the Project could result in adverse impacts on nesting raptors (other than goshawks). (*Less than Significant with Mitigation Incorporated*)

Of the 15 species of diurnal raptors recorded in the Project Site, the most common non-eagle raptors were red-tailed hawks (148 observations), sharp-shinned hawks *(*18 observations), and Cooper's hawks (nine observations). Diurnal raptor use documented during the Year 1 surveys was fairly consistent across seasons (Appendix C4a). Common raptor species such as the red-tailed hawk and sharp-shinned hawks and special-status raptor species may nest within or adjacent to the Project Site.

Activities associated with the construction and decommissioning of the Project could adversely affect nesting raptors directly or indirectly. Potential direct impacts include the physical removal of nesting habitat. The Project Site and Leasehold Area are currently managed for timber harvest, resulting in a patchwork of periodically cleared lands resulting in regularly changing nesting habitat conditions. Further, the Leasehold Area and surrounding forested landscape has an

abundance of both forested and open habitats for raptors, including goshawk and other forest raptors. In terms of Project related habitat loss, up to 4,464 acres of land would be cleared of vegetation for the construction of road corridors, electric collection system corridors, and turbine pad areas. Not all of these areas contain suitable raptor nesting habitat and the Project Site is not one large clearance area, but rather a patchwork of forested and open areas throughout the Leasehold Area. The habitat which would be permanently removed would not substantially reduce foraging, roosting, or nesting habitat for raptor populations and therefore, the effect of potential habitat losses to special-status raptors would be less than significant.

Additional direct impacts could include removal of or damage to an active nest from grading or the removal of trees or other vegetation. Potential indirect impacts on nesting raptors could occur if nesting activity is disrupted or abandoned, such as when adult attendance to eggs and young is negatively affected by visual or sound disturbances associated with construction activity.

Because of the abundance of suitable nesting habitat for raptors, it is anticipated that Project construction and decommissioning activities occurring during the nesting season would result in adverse direct and indirect impacts on nesting raptors. As this impact has the potential to disrupt annual nesting cycles for multiple raptors, the impact would be significant. However, it could be reduced to a less than significant level with the implementation of Mitigation Measure 3.4-6.

Mitigation Measure 3.4-6: Avoid and minimize construction-related impacts on nesting raptors (March 1 to August 15)

a) Where feasible, tree and vegetation removal activities shall be avoided in potential raptor nesting habitat during the avian nesting season (March 1–August 15) during each year of construction.
b) If construction is planned to occur during the avian nesting season from March 1–August 15, pre-construction raptor nesting surveys shall be conducted by a qualified biologist to identify raptor nests within 500 feet of proposed work areas. A qualified biologist is defined as a person who is knowledgeable in the distribution, habitat, life history, and identification of Northern California birds, is familiar with the survey methods to locate and survey for active nests within the Project Site and can acquire any permits needed to survey for federally listed or state-listed birds, if such permits become necessary.

c) Results of preconstruction raptor surveys will be reported to the Shasta County Department of Resource Management, Planning Division, USFWS, and CDFW by August 31 of the year in which the survey was conducted. The Shasta County Department of Resource Management, Planning Division shall, in coordination with resource agencies, determine whether or not the survey(s) were conducted in accordance with appropriate protocols and measure 3.4-6d is to be implemented. Construction shall not begin in the surveyed area until the Shasta County Department of Resource Management, Planning Division has confirmed that the survey(s) were conducted in accordance with appropriate protocols and, if necessary, that measure 3.4-6d has been implemented.

d) If active raptor nests are found during pre-construction surveys, a 500-foot exclusion zone shall be established around the nest in which no work would be allowed until the young have successfully fledged or nesting activity has ceased. The determination of fledging or cessation of nesting shall be made by a qualified biologist with

experience in monitoring raptor nests. Any sign of nest disturbances shall be reported to the Shasta County Department of Resource Management, CDFW and USFWS. In coordination with CDFW and/or USFWS, the County may modify the size of the exclusion zone depending on the raptor species and type of construction activity occurring near the nest.

Significance after Mitigation: Implementing the above mitigation measure would reduce the impacts of direct tree and vegetation removal, construction noise and disturbance on nesting raptors that could adversely affect nesting success. These avoidance and minimization measures would reduce this this impact to less than significant.

Impact 3.4-7: Construction and decommissioning of the Project could result in adverse impacts to nesting goshawks. (*Less than Significant with Mitigation Incorporated*)

Northern goshawk is moderately likely to occur within the Project Site; three were observed during avian surveys (Appendix C4). Construction would take place in areas of high quality goshawk nesting habitat and historic northern goshawk occurrence. Mature, dense forest stands with large trees and with an open understory are preferred by goshawks for nesting. Human activities near goshawk nests can cause failure, especially during the incubation period. However, because the area is regularly logged, the likelihood that northern goshawks nest within the Project Site is relatively low. However, if present and nesting, disturbance of nesting for up to two consecutive years, could adversely affect goshawk populations due to the small number of goshawk present in the region. Therefore, impacts on northern goshawk resulting from construction activities in or near active nests would be significant. Nesting goshawks are more difficult to locate than other raptors. Consequently, specialized survey methods are required. Potential impacts on nesting goshawks would be reduced to a less than significant level by implementing Mitigation Measures 3.4-7a and 3.4-7b

Mitigation Measure 3.4-7a: Implement Mitigation Measure 3.4-6: Avoid and minimize construction-related impacts on nesting raptors (March 1 to August 15)

Mitigation Measure 3.4-7b: Avoid and minimize construction-related impacts to nesting goshawks (March 1 to August 15)

a) Prior to any disturbance of forest habitats that fit the nesting criteria of northern goshawks, the Applicant will conduct acoustic surveys for northern goshawk during their nesting season (March 1–August 31) following methods outlined by Woodbridge and Hargis (2006) to assure species is not nesting or using the territory for nesting. If nesting goshawks are found, the nests would be avoided with a suitable buffer distance (minimum 500 feet) in coordination with CDFW.

b) Results of preconstruction goshawk surveys will be reported to the Shasta County Department of Resource Management, Planning Division and CDFW. The Shasta County Department of Resource Management, Planning Division shall, in coordination with resource agencies, determine whether or not the survey(s) were conducted in accordance with appropriate protocols. Construction shall not begin in the surveyed area until the Shasta County Department of Resource Management,

Planning Division has confirmed that the survey(s) were conducted in accordance with appropriate protocols.

Significance after Mitigation: Less than significant.

Impact 3.4-8: Operation of the Project could result in mortality and injury to raptors (including goshawk), as a result of collisions with wind turbines and electrical transmission lines. (*Significant and Unavoidable*)

The Project includes turbine design elements to reduce collision hazards for avian species, such as adherence to APLIC powerline design guidelines, approved tower lighting, and the absence of guy wires. However, the use of such elements does not eliminate the risk of turbine collision during operation. For raptors that are either resident or migrate through the Project Site, operation of the Project could result in direct impacts to this group through injury or mortality if they were to collide with wind turbines. Two years of avian surveys identified no obvious areas of concentrated use or flight corridors by eagles or other diurnal raptors within the Project Site (Appendix C4b) in any season. Topography can significantly influence the migration of raptors where major ridgelines creating lift are often followed by birds, or the shorelines of large bodies of water are also often followed, since both features can provide navigational guidance to migrating raptors (Appendix C4b). Although raptors do migrate through the Project Site, the topography of the sites consists of rolling hills with a lack of large waterbodies or river corridors that would act to concentrate raptors within the Project Site during migration. Hence, the overall risk of raptor collision with turbines is considered moderate, relative to areas where avian species concentrate.

During operations, risk may be low to northern goshawks, because of the small goshawk population in the area, limiting the potential for injury and mortality from transmission lines (collision and electrocution) and wind turbines (collision) that have been recorded elsewhere (Birdlife International, 2015). Because northern goshawks are less common within the Project Site (Appendix C8) and locally (Tetra Tech, 2013) and have had no mortality recorded due to wind turbines in California, there is little projected Project risk to this species during operations and impacts would be less than significant.

A detailed Project risk analysis to migrating or resident raptors is provided in Appendix C4b. Because of the close proximity of the Hatchet Ridge Wind Project, and the similarity of raptor species and vegetation located at the Project Site, data (including 3 years of post-construction raptor fatality surveys) from Hatchet Ridge project site is considered a reliable source of information to assess the likelihood of raptor collision risk at this Project Site. During Year 1 of fatality monitoring at Hatchet Ridge, the estimated annual fatality rate for raptors was 0.06 per wind turbine per year. During the second and third year, raptor fatality rates could not be calculated due to low sample sizes, with only eight diurnal raptor fatalities documented over three years. These included four red-tailed hawks, two sharp-shinned hawks, and one Cooper’s hawk, which are the three most common raptors also observed in the proposed Project Site; and one turkey vulture (Tetra Tech 2014). In a comparison of the composition of diurnal raptor species recorded at the Project Site from April 2017 through May 2018 and the Hatchet Ridge project site

from November 2010 to December 2013, the analysis found raptor use was similar between sites, with slightly higher red-tailed hawk and sharp-shinned hawk use found at the Project Site and slightly higher American kestrel and bald eagle use found at Hatchet Ridge project site (Appendix C4a; Tetra Tech 2014). The Project turbines are taller and have a larger rotor-swept area, compared to the Hatchet Ridge project, which would incrementally increase collision risk. The Project-specific study concluded, based on the results of pre- and post-construction studies at Hatchet Ridge and avian use surveys conducted at the Fountain Wind Project Site, that diurnal raptor fatality rates at the Project Site would be similar or slightly higher than those at the Hatchet Ridge project site (Appendix C4a).

Based on the three years of raptor fatality data from the adjacent Hatchet Ridge Wind project, and lower estimates of raptor fatalities from other studies assessed by Tetra Tech, it is likely the proposed Project would result in raptor mortality, between 4.3 and 53 raptors per year.

Because raptors have large home ranges, and thus have low population densities, but have lower reproductive rates due to their longer longevity, operational impacts on raptors would be significant, particularly for special-status species expected to occur regularly on the Project Site such as the Cooper's hawk and sharp-shinned hawk.

> **Mitigation Measure 3.4-8:** Implement Mitigation Measure 3.4-3b (Monitor avian and bat mortality rates during project operations).
>
> **Significance after mitigation:** Implementation of Mitigation Measure 3.4-3b would offset the impacts of Project operations on resident and migratory raptors by documenting any moralities and including operational modifications such as curtailment of turbine speed, ultrasonic deterrence systems or other mitigation to minimize raptor fatalities. However, due to the uncertainty associated with these estimates and the potential for mortality rates projected up to 53 raptors per year, this impact is considered significant and unavoidable. Implementing the above-identified mitigation measures would reduce operations-related impacts to the maximum extent practicable.

Other Resident and Migratory Birds

Waterfowl

Impact 3.4-9: Operation of the proposed project could result in mortality and injury to waterfowl as a result of collisions with wind turbines and electrical transmission lines. (*Less than Significant Impact*)

The majority of waterfowl observations (about 78 percent in Year 1 surveys) comprised three species: snow goose, greater white-fronted goose, and Canada goose, all of which are abundant species in the Pacific flyway (Appendix C4a). An analysis of collision risk to birds using the first year of avian data collected within the Project Site was conducted (Appendix C4a). During Years 1 and 2 of the avian surveys at the Project Site, the majority (97.1 percent and 99 percent, respectively) of waterfowl observations were recorded flying above the estimated rotor swept height of the wind turbines and therefore would not be at high risk of colliding with the Project

turbines. At Hatchet Ridge, waterfowl comprised up to 50 percent of bird mortality, primarily attributed to species making localized movements under high wind and/or low visibility conditions which may cause the birds to fly at a lower altitude and encounter turbines (Tetra Tech 2014). Nonetheless, the overall rate of waterfowl mortality at Hatchet Ridge was still comparatively low for the region and nationally, ranging from 0.27 to 0.39 birds/MW/year (Tetra Tech 2014). In addition, because the Project Site, like Hatchet Ridge, is heavily forested, waterfowl would likely fly at a higher altitude over the trees, and it does not appear that waterfowl or waterbirds use the area as migratory stop-over sites.

In the same avian risk of collision review, waterbirds, including the American white pelican, did not appear to be particularly susceptible to collision with wind turbines. In addition, suitable breeding and stopover habitat for American white pelican is also absent from the Project Site. From Project Site-specific studies (Appendix C4a), it can be concluded that the majority of waterbirds, including the American white pelican, would fly well above the rotor swept height and height of electrical transmission lines within the Project Site. Based on observed species use of the site and review of species habitats, the potential risk of substantial waterfowl mortality is considered low. Because the level of waterfowl collision related injury or mortality is not anticipated to occur at levels which would adversely affect population levels, operational impacts on waterfowl and waterbirds would be less than significant.

Mitigation: None required.

Sandhill Crane

Impact 3.4-10: Construction, operation, and decommissioning of the Project could have potential significant impacts on sandhill cranes during migratory movements in fall and spring, and could result in mortality of and injury to sandhill cranes. (*Less than Significant Impact*)

If present, sandhill cranes at the Project Site during construction and operation could be impacted predominantly during the fall and winter, as well as potentially in the spring when large flocks of birds travel through the vicinity via the North Pacific Flyway on migration. The probability of collision of greater sandhill cranes with powerlines, utility poles, wind turbines, turbine towers, and met station towers during construction and operation of these facilities would increase when: a) flocks are large, b) visibility is hampered, c) wind speeds are excessive, and d) flight occurs at night. Further, the timing of migration late in the fall season and well into winter increases the probability of birds encountering unfavorable weather such as low cloud ceiling, storm winds, or fog over the ridge. There are no available data on the behavior of birds under poor visibility conditions at the Project's ridgetops.

A review of known sandhill crane interactions with wind turbines suggest sandhill crane collisions with wind turbines are rare. (Appendix C4). Wind farms located in local flight routes between foraging and roosting areas present a greater risk to the sandhill crane, particularly during inclement weather conditions, as both factors produce lower elevation flights (Navarrete and Griffis-Kyle 2014). The relative risk to sandhill crane is considered low because the Project

Site is not located within a daily flight route and migrating cranes are known fly at high altitudes (e.g., 3,000 to 5,000 feet above ground) that are generally above the height of proposed facilities (Johnsgard, 2015). Although, injury and fatality could occur to migrating cranes during operation of the turbines, the nearby Hatchet Ridge Wind Project monitored avian fatalities for the first three years of operation and zero sandhill crane mortalities were observed (Tetra Tech, 2014).

Sandhill crane injury or mortality from collision with turbine towers, turbines, and METs could occur during construction of these facilities, especially during migration periods when most crane traffic occurs. Low-light and poor visibility conditions may be particularly hazardous to migrating cranes and increase the probability of collision with unlit structures. Collisions may also occur as a result of crane interactions with ridgetop power lines.

The use of Federal Communication Commission-required lighting on towers during crane migratory periods would increase tower visibility to birds and potentially reduce collisions with towers and turbines during operations. Maintenance and upkeep of the Project facilities during operation is not likely to impact sandhill cranes, because the Project Site does not support suitable stopover or foraging habitat, therefore the species would not be exposed to maintenance activities. Because the likelihood of collision risk would be low, incidental injury or mortality of migrating sandhill cranes would not occur at a level which would result in a decline of sandhill crane populations. Therefore, operating impacts on sandhill cranes would be less than significant.

Although operational impacts would be less than significant, there is a remaining very low risk of collisions occurring if species use of the area increases from observed levels. In an effort to further reduce potential effects on sandhill cranes, the County may elect to include additional conservation measures as a condition of permit approval. Recommended measures include:

> **Sandhill Crane Conservation Measures:** Modify EIR Mitigation Measures 3.4-3a (Avoid and minimize operational impacts on avian and bat species) and 3.4-3b (Monitor avian and bat mortality rates during Project operations) to include sandhill crane. This would offset the impacts of Project operations on sandhill cranes by documenting any mortalities of cranes and implementing operational changes to reduce mortality.
>
> In addition, inclusion of the following conservation measure as a condition of approval would further reduce operational-related impacts to sandhill cranes.
>
> **Sandhill Crane Conservation Measure: Minimize operational impacts to Sandhill cranes by timing the construction of tower and turbine installations, and by putting avian deflectors on ridgetop powerlines.**
>
> 1) Time the installation of METs, turbine towers, and turbine blades so that no tall structures are erected to final heights and left unlit through the fall migration period of sandhill cranes (September through November).
>
> 2) Where mountain top construction of new transmission lines could pose hazards to cranes, efforts would be made to use highly visible markers to aide in bird avoidance of lines. For sandhill cranes, it is expected that most or all collisions with powerlines would take place at night, in low light condition or in inclement weather like fog,

heavy rains, and high winds. Using UV lighting, glow-in-the-dark tape, or bird deflection devices with short gaps between devices would limit risk of collision.

Nesting Songbirds

Impact 3.4-11: Construction and decommissioning of the Project could result in adverse impacts to nesting songbirds, potentially including special-status species. (*Less than Significant Impact*)

Of the 78 species of small birds recorded in the study area, the most common songbirds included dark-eyed junco, mountain chickadee, western bluebird and Steller's jay, with woodpeckers also common. Songbird use in both years of avian surveys was relatively consistent across all seasons and areas surveyed (Appendix C4a, Appendix C4b). The results of avian surveys further suggest that there is no specialized use of nesting habitats by resident small birds. As shown in Table 3.4-3, five special-status songbird species were identified as having a high potential to occur, including Vaux's swift, olive-sided flycatcher, Cassin's finch, Lewis' woodpecker, and yellow warbler. One additional species, willow flycatcher, a state-endangered species was also identified but with a low potential to occur on the Project Site.

Most Songbirds, including special-status species Olive-sided flycatcher, Cassin's finch, and Lewis' woodpecker

Activities associated with the construction, operation, and decommissioning of the Project could potentially adversely affect nesting songbirds, including the special-status species, directly or indirectly. Potential direct impacts to nesting songbirds protected by the Migratory Bird Treaty Act include the physical removal of nesting habitat or the direct removal or damage to an active nest from the grading or the removal of trees or other vegetation that might provide a nesting substrate. Direct impacts to birds include injury, mortality, nest destruction or disturbance resulting in nest abandonment. Potential indirect impacts on nesting song birds could occur if nesting activity or adult care of eggs and young is negatively affected by visual or sound disturbances associated with construction activity. The majority of songbird species using the Project Site including special-status species, olive-sided flycatcher, Cassin's finch, and Lewis' woodpecker do not require hard to find specialized nesting habitat. The removal of nesting habitat within the Project Site and potential nesting disruption due to construction noise are not anticipated to adversely affect songbird species populations. Because the potential effect on any individual songbird species population would not be substantial, the impact on most songbird species including olive-sided flycatcher, Cassin's finch, and Lewis' woodpecker from construction and operation of the project would be less than significant.

Although the impact on nesting songbirds is less than significant, the County may elect to include additional conservation measures as a condition of permit approval to further reduce potential adverse impacts on nesting songbirds.

> **Conservation Measure for Nesting Songbirds:** Avoid and minimize construction-related impacts to nesting songbirds

> Prior to any disturbance of nesting habitat during breeding season (March 1 to August 15), a qualified biologist will survey the area to be impacted to locate any active bird nests. Active nests will be avoided by a suitable buffer distance (e.g., 100 to 250 feet).

Three special-status passerine birds, Vaux's swift, yellow warbler, and willow flycatcher, may occur in the Project Site and have specialized habitat requirements that may be directly impacted by the construction and decommissioning of the Project.

Vaux's swift

Vaux's swifts use communal roosts, typically mature conifers with large top or side cavities year-round, including during nesting and migratory periods. Direct removal of active communal roost trees during the nesting season could result in the temporary displacement of hundreds of individuals. However, the existing use of the Leasehold Area for timber management likely precludes the existence of large trees with suitable roosting cavities, and no communal roosts were identified in the Project Site during the avian surveys (Appendix C4). As a result, the likelihood of a communal roost being affected by vegetation clearing or other construction activities is low. The potential impact on nesting Vaux's swift is less than significant.

Although the impact on Vaux's swift from Project construction, operation and decommissioning is less than significant, if communal roosts, previously undetected are present and active impacts could occur. To further reduce the potential for adverse impacts, the County may include additional conservations as a condition of permit approval. Recommended measures include:

> **Conservation Measure for Vaux's Swift:** To minimize direct and indirect impacts on Vaux's swift, a pre-construction habitat assessment shall be conducted to determine the location of potential roost sites used by this species in the Project Site, as follows:
>
> 1. Conduct a habitat assessment for potential Vaux's swift roost sites: Habitat assessment shall be completed prior to removing or altering any trees, snags, or structures that could potentially provide roosting habitat for Vaux's swift. An assessment of such habitat will take place during the spring and fall roosting seasons. The assessment shall be conducted by an experienced and qualified biologist who is able to identify potential Vaux's swift roosts and nest trees. Emphasis will be on large, live and dead trees with exposed hollowed cavities in tree trunks.
>
> 2. Reduce any temporary impacts to roost sites during construction and decommissioning. Assess any trees (and structures during decommissioning) located within a minimum 200-foot buffer area from construction disturbance areas. In general, the buffer area will cover all habitat within the line of sight from the edge of the disturbance area and may be adjusted and expanded as necessary by a qualified biologist, depending on the severity of planned disturbance. Impact minimization measures may include:
>
>   a. Delaying work in a buffer area until swifts would be absent from their roost, or present but in low numbers.
>
>   b. Employing the use of sound or vision barriers between the active roost and the temporary disturbance activity.

c. Initiating any disturbance prior to a sensitive season and continuing into the following sensitive season so that Vaux's swift can avoid establishing a roost in the area of disturbance or can become desensitized to the disturbance prior to a sensitive season.

d. As an alternative to implementing the above listed measures, all highly suitable roost habitat may be surveyed and assessed, and the qualified biologist can make the determination that survey approaches and results are sufficient to indicate an absence of roosting Vaux's swift in the Project Site.

Yellow Warbler and Willow Flycatcher

The yellow warbler is a migratory species in northern California, with presence in the region during the spring and fall. Throughout its range, the yellow warbler is found exclusively in riparian habitats (Lowther et al., 1999). Riparian habitat in the study area is limited and, within the Project Site, 115.2 acres of riparian habitat may be directly impacted by the Project. As a riparian obligate, the loss of riparian habitat could adversely affect migratory populations of yellow warbler. However, because there is an abundance of riparian habitat in the region, the loss of 115.2 acres of riparian habitat would not result in a decline in yellow warbler populations. Migrating yellow warblers could be also deterred from using habitat within and adjacent to the Project Site by noise and disturbance associated with Project construction and decommissioning, and by collision during Project operation. The number of injuries and mortalities resulting from collisions would not result in a substantial reduction in the population of yellow warbler in the region, and would therefore be less than significant.

No active willow flycatcher breeding populations are specifically known to occur on the Project Site based on the results of protocol-level surveys for willow flycatcher conducted on the Project Site (Appendix C12). However, willow flycatchers may fly over the Project Site during migration and may use available patches of riparian/wetland and meadow habitat as stopover habitat in spring and fall (Appendix C12). As stated above up to 115.2 acres of riparian habitat may be removed or otherwise altered as part of Project construction. Migrating flycatchers could be impacted by noise and disturbance associated with Project construction and decommissioning, and by collision during operation. Due to the lack of breeding populations within the Project Site, and the low potential for willow flycatcher to occur, impacts on willow flycatcher from construction, operation and decommissioning of the Project would be less than significant.

Although, Project impacts on yellow warbler and willow flycatcher would be less than significant, adverse effects would occur. To further reduce the potential for and level of adverse impacts, the County may include additional conservations as a condition of permit approval. Recommended measures include:

Conservation Measure for Willow Flycatcher and Yellow Warbler: The following measures to avoid and minimize the removal and fragmentation of suitable habitat for the willow flycatcher. This measure also would protect yellow warblers, which also use riparian habitat.

1) Using the willow flycatcher habitat model developed by CDFW (Timossi et al., 1995) and using a biologist knowledgeable about willow flycatcher habitat to

examine aerial imagery of the Project Site, map areas of suitable habitat within the final boundaries of the Project Site and ground-truth the presence and quality of this habitat. This information would be used by the Applicant to modify road construction and other plans, if necessary, to minimize the removal or degradation of willow flycatcher habitat. Upon completion of construction, the Applicant will submit to the Shasta County Department of Resource Management Planning Division, CDFW, and USFWS a report detailing the results of these minimization efforts, and shall provide a summary of acreages of breeding and foraging habitat that were temporarily or permanently affected by construction.

2) For all willow flycatcher habitat identified to be impacted within the final Project Site, conduct pre-construction protocol surveys during the breeding season (June 15 to August 15) using the most recent CDFW survey guidelines (Bombay et al., 2003). Survey results will be provided to the Shasta County Department of Resource Management Planning Division and CDFW. If additional areas of potentially suitable habitat than those already surveyed will not be directly impacted during Project construction, then no further willow flycatcher surveys will be required.

   If nesting willow flycatchers or yellow warblers are found, coordinate with CDFW to protect these sites and buffer them from disturbance using a 250-foot exclusion zone (or width recommended by CDFW/USFWS depending on disturbance type) around the habitat or any nest sites found. Within this zone, no work will be allowed until the young have successfully fledged or nesting activity has ceased. The determination of fledging or completion of nesting shall be made by a qualified biologist with experience in nest searching and monitoring for willow flycatchers, in coordination with CDFW. Any active nest sites shall be monitored periodically throughout the nesting season to identify any sign of disturbance and to document nest status.

Pit Roach, Amphibians and Western Pond Turtle

Impact 3.4-12: Site preparation and construction, operations and maintenance, and decommissioning and site restoration of the Project could result in habitat loss and water quality impacts on Pit roach, special-status amphibians and western pond turtle. (*Less than Significant with Mitigation Incorporated*)

The site preparation and construction, operations and maintenance, and decommissioning phases of the Project have potential to cause temporary indirect and direct, and permanent indirect adverse impacts to aquatic and semi-aquatic species within the Project Site. Approximately 38 acres of wetlands and waters were identified on the Project Site (Table 3.4-2). These wetland and other waters habitats may be occupied by aquatic and semi-aquatic (also use upland habitat) species. Although Project development would not impact all of wetlands and waters in the Project Site, some of these habitats would be removed or disturbed. Impacts on wetland and other aquatic habitats are discussed below under Impact 3.4-16. Briefly, permanent impacts to wetlands and other waters would occur on 2.22 acres of wetlands and 1.2 acres of other waters. These impact acreages represent 8 percent of the wetlands and 11 percent of other waters mapped in the aquatic resources survey (Table 3.4-2, Appendix C2), which covered a larger survey area than the Project Site. Temporary impacts would occur on 1.48 acres of wetlands and 0.64 acre of other waters.

The removal or disturbance of wetlands and other waters would reduce available habitat for aquatic and semi-aquatic species in the Project Site. Because of the relatively small amount of habitat present, this could result in an adverse effect on local pit-roach, amphibian and western pond turtle populations, which would be considered a significant impact. This impact could be reduced to a less than significant level, with the implementation of habitat and water quality protective and restoration measures, and with a minimum of 1:1 compensation for permanently removed habitat. Implementation of Mitigation Measures 3.4-16 a, b and c, as described under Impact 3.4-16, would reduce these impacts to a less than significant level.

During construction, there is a low likelihood that semi-aquatic species using upland habitat could also suffer injury or mortality from increased vehicle traffic (compared to current timber harvest activities) and ground disturbing activities. Operational vehicle traffic is expected to be similar or less than current conditions and would not result in increased impacts on semi-aquatic species. Increased injury and mortality of special-status amphibians and western pond turtle during construction is not expected to affect species populations, which are concentrated near aquatic habitat and would be less than significant. The County may elect to include additional measures as conditions of permit approval to further protect semi-aquatic species from temporary construction related impacts. Implementation of the Terrestrial Species Conservation Measure discussed under Impact 3.4-14 would reduce potential impacts on semi-aquatic species including sensitive amphibians and western pond turtle within upland areas.

Additionally, Clearing, grading, and other soil disturbances during construction have the potential to increase erosion from the Project Site into aquatic habitats, which could result in temporary indirect adverse impacts to aquatic species. Indirect impacts may include temporary increases in turbidity of surface waters and transport of other pollutants such as oil from machinery into aquatic habitats. These direct adverse impacts to water quality may have temporary indirect adverse impacts on aquatic species. Unless mitigated, these impacts could reduce local aquatic and semi-aquatic species populations, which would be considered significant. Effects from degraded water quality could be reduced by using erosion control, pollution control, and wetland and waters protective measures. Implementation of Mitigation Measures 3.4-12 would reduce this potential impact to less than significant by avoiding and minimizing impacts on habitat for aquatic and semi-aquatic species.

> **Mitigation Measure 3.4-12:** Implement Mitigation Measure 3.12-1 (Water Quality Best Management Practices during Activities in and near Water) and Mitigation Measure 3.4-16b (Avoid or Minimize Impacts to Wetlands and Other Waters)
>
> **Significance after Mitigation:** Implementing these mitigation measures would reduce the potential water quality impacts of the Project on wildlife by partial avoidance of and compensation for the removal of wetland and other waters habitat. The mitigation measures would also minimize adverse impacts from erosion or other pollution on water quality of Project Site surface waters to less than significant. The recommended Terrestrial Species Conservation Measure would further reduce the less than significant Project impacts to Pit roach, special-status amphibians and western pond turtle.

Bats

Impact 3.4-13: Operation and maintenance of the Project could result in direct mortality and injury to bats, including special-status species. (*Significant and Unavoidable)*

Bats have low reproductive rates and require high adult survivorship to avoid population decline (Thompson et al. 2017). Operation of the Project poses a risk of direct injury and mortality to bats, including special-status species, as a result of wind turbine operation in areas where the flight altitudes of foraging, migrating, and transiting bats coincides with the height of wind turbine blades. Based on the 3-year monitoring completed for the Hatchet Ridge Wind Project (Tetra Tech, 2014) and the Project-specific bat acoustic survey report (Appendix C6), the likelihood of injury risk is considered low for special-status bat species, but risk is higher for other bat species such as hoary bat. Recent mortality estimates (Arnett and Baerwald 2013) and models (Frick et al. 2017), have identified potential population-level effects from wind operations on particular bat species, including hoary bat. Surveys confirm hoary bat as one of the most common species on the Project Site (Appendix C6) and surveys at the Hatchet Ridge wind facility confirm that hoary bat are particularly vulnerable to wind operations in the region (Tetra Tech 2014). Based on this date it is anticipated the operation of the Project would result in adverse effects on bats, potentially affecting bat populations. As a result, the injury and mortality of bats resulting from Project collisions with turbines would result in a significant effect.

Maintenance of the Project would be unlikely to result in a significant adverse impact to bat species, unless unforeseen circumstances arise, for example, if repair work is conducted at night under artificial lighting that attracts flying insects.

To monitor any adverse effects to bats, including special-status species, the Project shall implement Mitigation Measure 3.4-13, which would document and report bat mortalities from the Project, identify appropriate mortality minimization measures, and implement all recommended minimization measures to reduce mortality. Implementing this measure would reduce operational impacts on bats, but impacts would remain significant and unavoidable.

> **Mitigation Measure 3.4-13:** Implement Mitigation Measure 3.4-3b (Monitor Avian and Bat Mortality Rates During Project Operations.
>
> **Significance after Mitigation:** Implementing Mitigation Measures 3.4-13 would allow the identification of potentially hazardous towers to bat species, if present, which would facilitate adaptive management approaches such as curtailment and deterrence to deter bats if, as a result of post-construction monitoring, it is determined that multiple individuals of a particular bat species are being injured or killed by collisions with turbines consistent with the thresholds identified in Mitigation Measure 3.4-3b. Though implementation of this measure would reduce impacts on bat species, impacts on bats would remain significant and unavoidable.

Terrestrial Mammals

Impact 3.4-14: Site Preparation and Construction and Decommissioning and Site Restoration of the Project could result in temporary adverse impacts to special-status mammals. (*Less than Significant Impact)*

Site preparation and construction may result in temporary adverse impacts to special-status mammals including the Oregon snowshoe hare and the Pacific fisher through injury or death to individual animals from interactions with construction equipment; entrapment in open holes or trenches; removing access to cover, forage or water; or through temporary disturbance to or permanent loss of habitat. Construction activity could interfere with normal foraging, breeding, dispersal, and other typical behaviors, particularly from noise, activity, as well as attractants such as food-related trash. Although construction would result in disturbance, because the site is currently active timber managed lands, large truck traffic and vegetation clearing already occurs. The Project would increase the level of activity during construction but is not likely to result in an adverse effect on special-status mammal populations given the abundance of similar habitat available in the region and Project vicinity. Therefore, the impact on special-status terrestrial mammals would be less than significant.

When completed, only substation, switchyard, and operations facilities would be fenced; therefore, movement through the landscape is not expected to be significantly impacted for terrestrial mammals and impacts from operations are expected to be less than significant with no mitigation required.

Although the impacts on special-status terrestrial mammals would be less than significant, the County may elect to include additional measures as conditions of permit approval to further reduce adverse effects. Suggested conservation measures which would provide best management practices to reduce Project-related impacts to terrestrial mammals include:

> **Terrestrial Species Conservation Measure: Avoid and minimize impacts to terrestrial special-status species.**
>
> The Applicant will implement the following measures to minimize and monitor impacts during both construction and decommissioning phases:
>
> a) Applicant will design and implement a plan for workers encountering injured or dead special-status terrestrial species during construction, to include a stop-work order within 50 feet, notification of a qualified biologist, and notification of CDFW and/or USFWS as appropriate.
>
> b) All personnel on-site (i.e., employees, contractors, inspectors, and visitors) will check for presence of wildlife under or in equipment before operating. Wildlife found underneath or within vehicles or equipment will be allowed to leave voluntarily or removed by a biological monitor if it is safe to do so. State or federally listed species will not be handled and USFWS and/or CDFW will be contacted.
>
> c) All excavations will be backfilled, sloped at a 3:1 ratio, covered completely to prevent wildlife access, or fully enclosed with exclusion fencing at the end of each workday. If an animal is found entrapped, construction will be delayed until it has left the excavation or been removed by a qualified biological monitor if it is safe to do so.

d) Natural water sources will remain unfenced in order to provide access for terrestrial and semi-aquatic wildlife.

e) All food-related trash will be contained in secured, wildlife-proof containers to prevent attracting wildlife to work areas.

f) Vehicle speeds will not exceed 15 miles per hour during all phases of the Project; speed limit signs will be posted at all entry points and throughout the Project Site.

g) High-intensity lighting will be minimized to the level needed for worker safety.

h) Nighttime vehicle traffic will be minimized.

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b) Whether the Project would have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by CDFW or USFWS.

Rocky Mountain Maple Riparian Scrub

Impact 3.4-15: Site preparation and construction, operations and maintenance, and decommissioning and site restoration of the Project would result in adverse impacts to riparian habitat or other sensitive vegetation communities. (*Less than Significant with Mitigation Incorporated*)

Site preparation and construction activities occurring within the Rocky Mountain Maple Riparian Scrub sensitive natural community, which also describes most riparian habitat mapped in the Project Site (107.2 acres), would result in a direct impact through the removal of vegetation. Construction activities would include clearing and grubbing, topsoil stripping, grading, compaction, utility trenching and placement of aggregate surfacing. Grading would include removal, storage and disposal of soil, gravel, vegetation, organic matter, loose rock and debris. Although the exact footprint of vegetation removal may not encompass the entire Project Site, the potential loss of over 100 acres of sensitive Rocky Mountain Maple Riparian Scrub would be significant due to both the acreage loss and the fracturing of the community through the creation of cleared areas (i.e. roads).

Ongoing operations and maintenance impacts to sensitive vegetation communities and riparian habitats could occur through edge effect degradation or introduction of weeds. With an anticipated operational lifespan of 40 years, Project-caused changes to the riparian habitats and sensitive natural communities may therefore occur over time from these indirect permanent effects. It is unlikely that edge effect degradation would result in a substantial reduction in the Rocky Mountain Maple Riparian Scrub community. Therefore, the impacts on sensitive vegetation communities from operation and maintenance activities would be less than significant.

Project decommissioning and site reclamation would include restoration of the site to pre-construction conditions. This would include the restoration of lost Rocky Mountain Maple Riparian Scrub and rehabilitation of adjacent areas that were affected by edge effect disturbance or introduction of weeds. Therefore, impacts associated with decommissioning and restoration activities would be beneficial to sensitive vegetation communities.

To avoid potential significant impacts of construction, specifically the removal of up to 107.2 acres of Rocky Mountain Maple Riparian Scrub habitat or other sensitive vegetation communities, implementation of Mitigation Measures 3.4- 15a and b would be required.

Mitigation Measure 3.4-15a: To minimize the amount of riparian vegetation removed during construction. Implement Mitigation Measure 3.4-16b for wetlands (Avoid and minimize impacts to wetland and other waters).

Mitigation Measure 3.4-15b: Compensate for Impacts to Rocky Mountain Maple Riparian Scrub Habitat.

The Applicant shall implement a Reclamation and Revegetation Plan that includes detailed measures for the compensation, restoration, and/or enhancement of Rocky Mountain Maple Riparian Scrub Habitat on a per-acre basis. The standard for mitigation shall be no net loss. If restoration is selected as a method of compensatory mitigation, the Applicant shall prepare a riparian mitigation and monitoring plan as part of the Project's reclamation and revegetation plan and shall submit it to the County for review, determination of adequacy, and approval. Mitigation ratios shall be at a1:1 level.

The Rocky Mountain Maple Riparian Scrub Habitat mitigation and monitoring plan shall be written by a qualified biologist and shall include the following elements, at minimum:

a) goals of the plan and permitting requirements satisfied;

b) Riparian habitat restoration activities and locations, including the restoration of temporarily affected riparian habitat to preconstruction conditions;

c) monitoring and reporting requirements (including monitoring period), and criteria to measure mitigation success; and

d) remedial measures, should mitigation efforts fall short of established targets.

The County may consult with CDFW about the adequacy of the plan and may consult with other agencies, if the plan aims to fulfill multiple permitting and mitigation requirements.

Significance after Mitigation: With implementation of these mitigation measures, impacts on sensitive vegetation communities and riparian habitat would either be avoided, minimized or impacts would be compensated at a 1:1 or greater ratio, consistent with any resource agency commitments discussed in Mitigation Measure 3.4-15b Waters). Therefore, following mitigation, this impact would be less than significant.

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c) Whether the Project would have a substantial adverse effect on state or federally protected wetlands (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.

Impact 3.4-16: Site preparation and construction, operations and maintenance, and decommissioning and site restoration of the Project could result in adverse impacts to wetlands and other waters. (*Less than Significant with Mitigation Incorporated)*

Project site preparation and construction would result in both temporary and permanent direct impacts to wetlands and other waters subject to federal and State jurisdiction under Sections 401 and 404 of the Clean Water Act. Therefore, implementing the Project would require a Clean Water Act Section 404 permit from USACE and a Water Quality Certification from the Central Valley RWQCB. Wetlands that meet USACE criteria for hydrology, hydric soils, and hydric vegetation as mapped for purposes of the Project (Appendix C2) are subject to USACE jurisdiction These and other mapped features may be determined to be Waters of the United States (WOTUS) and/or waters of the State of California, and therefore subject to jurisdiction of the USACE and/or RWQCB.

Based on anticipated Project disturbance (Table 2-1), permanent impacts to wetlands and other waters would occur to 2.22 acres of wetlands and 1.2 acres of other waters. These impact acreages represent 8 percent of the wetlands and 11 percent of other waters mapped in the aquatic resources survey (Table 3.4-2; Appendix C2), which covered a larger survey area than the Project Site. The permanent removal or filling of 3.44 acres of wetlands and other waters would be considered a substantial adverse effect and therefore a significant impact. Temporary impacts would occur to 1.48 acres of wetlands and 0.64 acre of other waters. These direct impacts would occur from the ground-disturbing activities listed above and would be considered temporary in nature in areas where wetlands and other waters are not filled, and functions are not lost. Temporary impacts to wetlands would not permanently alter wetland hydrology (though soils or vegetation may be altered) and would only apply to wetlands in which restoration is deemed feasible prior to project implementation.

The Project would require road crossings at a total of 32 streams. Twenty-four new road crossings would be required, including 5 perennial streams, 12 ephemeral and intermittent streams and 7 non-vegetated ditches. Eight crossings would occur where there are existing roads and crossings, which may require improvement or replacement. These include 3 perennial streams and 5 ephemeral and intermittent streams. Construction of stream crossings (Figure 3.12-1 and Figures 3a and Figure 3b in Appendix C2) would temporarily affect water quality of other waters during construction and installation of culverts, which may result in erosion of bank soils into waterways, as well as potential spills of oils and other hazardous materials used with equipment. Following construction, permanent impacts would only be to the crossing itself.

Permanent impacts due to filling and grading from road construction activities would result in wetland functional loss, including loss of habitat functions, water quality functions, and hydrology functions. Construction or widening existing access roads, installing or replacing existing culverts, and placement of project staging areas would result in direct impacts to aquatic resources. Moreover, incidental leakage of hazardous materials (for example fuel and lubricants)

or erosion caused by construction activity may result in surface runoff and inputs of sediment and contaminants into aquatic resources. In addition to proposed direct impacts, indirect impacts to wetlands and other waters may include introduction of invasive species, upslope introduction of dust and other contaminants, and vehicle emissions associated with the construction and operation of the project. If hazardous materials or erosion occur and effect wetlands or other waters, the impacts would be significant.

The exact types and extent of impacts to aquatic resources would be determined upon completion of the final site plan as part of the Clean Water Act Section 404 permitting process.

The implementation of Mitigation Measure 3.16a, which would require the implementation of best management practices to minimize damage to waterways during construction, and Mitigation Measure 3.4-16b and 3.4-16c would reduce or compensate for impacts from loss and damage to wetlands and other waters to less than significant.

> **Mitigation Measure 3.4-16a:** Implement Mitigation Measure 3.12-1 (Water Quality Best Management Practices during Activities in and near Water)
>
> **Mitigation Measure 3.4-16b: Avoid and Minimize Impacts to Wetlands and Other Waters.**
>
> The Applicant will avoid and minimize impacts on wetlands and other waters by implementing the following mitigation measures:
>
> a) Avoid direct and indirect impacts to wetlands and streams in final siting and design to the maximum extent feasible.
>
> b) Design stream crossings, including culverts, to pass a 100-year event without increasing average flow velocity or bed/bank scour potential.
>
> c) Monitor stream crossings in burn areas seasonally and maintain culverts and drains, since burned areas may experience sediment and debris loads that could result in clogged or blocked culverts.
>
> d) The Applicant shall also submit a site plan showing all aquatic resources and appropriate regulatory buffers or setbacks to Shasta County.
>
> e) The Applicant shall assign a qualified wetland scientist to mark all aquatic resources associated with the final project site plan. Temporary high visibility fencing, and signage may be used to help protect these areas. The qualified wetland scientist would also identify corresponding setbacks to aquatic resources, as required by Project permits.
>
> f) On a continuous basis, a qualified wetland scientist or biological monitor shall be assigned to visually inspect aquatic resources, and surrounding areas, for evidence of hydrologic loss in aquatic areas.
>
> g) Develop a Spill Prevention, Control, and Countermeasures (SPCC) Plan to minimize adverse impacts to wetlands.

Mitigation Measure 3.4-16c: Compensate for Impacts to Wetlands and other Waters.

The Applicant shall implement a Reclamation and Revegetation Plan that includes detailed measures for the compensation, restoration, and/or enhancement of wetlands and other waters on a wetland type per-acre basis. The standard for mitigation shall be no net loss. If restoration is selected as a method of compensatory mitigation, the Applicant shall prepare a wetland mitigation and monitoring plan as part of the Project's reclamation and revegetation plan and shall submit it to the County for review, determination of adequacy, and approval. Mitigation ratios shall be calculated following USACE wetland mitigation procedures and shall be based on the actual impact acreage of final design per as-built construction drawings and the results of the preconstruction surveys. After review and approval by the County and pertinent regulatory agencies, mitigation shall be carried out at a ratio no less than 1:1, or another ratio approved by the appropriate jurisdictional agency, whichever is higher.

The wetland mitigation and monitoring plan shall be written by a qualified biologist and shall include the following elements, at minimum:

a) goals of the plan and permitting requirements satisfied;

b) wetland restoration activities and locations, including the restoration of temporarily affected wetlands and other waters to preconstruction conditions;

c) monitoring and reporting requirements (including monitoring period), and criteria to measure mitigation success; and

d) remedial measures, should mitigation efforts fall short of established targets.

The County may consult with USACE about the adequacy of the plan and may consult with other agencies, if the plan aims to fulfill multiple permitting and mitigation requirements.

Significance after Mitigation: Implementing these mitigation measures would reduce the potential impacts of the Project on wetlands and other waters to less than significant because impacts on these resources either would be avoided or would be compensated for at a ratio of 1:1 or higher, as directed by the appropriate jurisdictional agencies. A 1:1 ratio would be adequate to achieve a no-net-loss scenario if the following mitigation measures are adhered to and wetland revegetation efforts are successful after the monitoring period. The mitigation measures would reduce construction-related impacts of the Project on wetlands and other waters to less than significant.

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d) Whether the Project would interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.

Impact 3.4-17: Site preparation and construction, operations and maintenance, and decommissioning and site restoration of the Project would not result in adverse impacts to movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites. (*Less than Significant Impact*)

Although the Project Site is privately owned and managed for timber production, the forested area of the site likely helps connect older forest habitats of the Lassen and Shasta Trinity national

forests at a landscape-level. However, in desktop review of the Project Site (Appendix C1), and in conducting 2 years of a variety of wildlife surveys within the Project Site, no evidence of any significant movement corridor for wildlife species was documented (Appendix C10).

Suitable deer fawning habitat is present on the Project Site and includes dense forests and shrublands, including riparian and mountain habitats, with abundant forage and water nearby. Disturbance to deer fawning habitat and mammal travel corridors could occur during construction activities, depending on the time of year that activities occur. Although development of the Project is not expected to exceed levels of activity that would occur at the Project Site during timber harvest operations or associated activities such as road maintenance or construction, the development of the Project will remove vegetation that may serve as fawning habitat and cover for travelling mammals. However, there remains substantial areas of underbrush and forestland in the vicinity to provide fawning habitat. Security fencing or other physical barriers that may impede terrestrial animal movements would be limited during construction (e.g., chain-link fencing around the proposed O&M building or other secure structures). The operation and maintenance phase of the Project is unlikely to have significant adverse impacts to deer fawning habitat and mammal travel corridors. It is expected that traffic levels would be similar to those currently used for forest management and timber harvest and for other land uses in the area. A small increase in traffic on existing and proposed access roads is very unlikely to present a barrier to wildlife movement because the roadways would remain rural and lightly traveled after Project construction. Turbine operation is not expected to impact migration corridors as the turbines themselves do not block passage of species through the site. The risk of collision with the turbines has been accounted for elsewhere.

Potential collisions of wildlife and vehicles would be low due to the Applicant's proposal to work primarily during daylight hours with speed restrictions (see Section 2.4.5.5, *Construction Schedule and Workforce*). Potential impacts during decommissioning and reclamation of the Project Site are expected to be similar to site preparation and construction, but with a shorter duration of adverse impacts. Impacts would be less than significant.

Due to the local terrain for watersheds in the Project's vicinity, hydrological conditions for surface waters tend to be intermittent or ephemeral in the winter months and dry in the summer depending on snow melt and winter rains. While native resident or migratory fish may traverse the Project Site when surface drainage allows, impacts to movement of fish from the Project would be less than significant because of the seasonality of the watercourses. Although impacts are less than significant, implementation Mitigation Measure 3.4-16b protecting wetlands and other waters would further reduce the likelihood of any potential impacts to fish.

Thus, impacts to resident or migratory fish or wildlife species, established wildlife corridors, or native wildlife nursery sites from Project construction, operation and maintenance, and decommissioning would be less than significant. Although impacts are less than significant, implementation of Mitigation Measure 3.4-14 (Avoid and Minimize Impacts to Terrestrial Mammals) would reduce the potential for vehicular wildlife mortality and disturbance to fawning habitat.

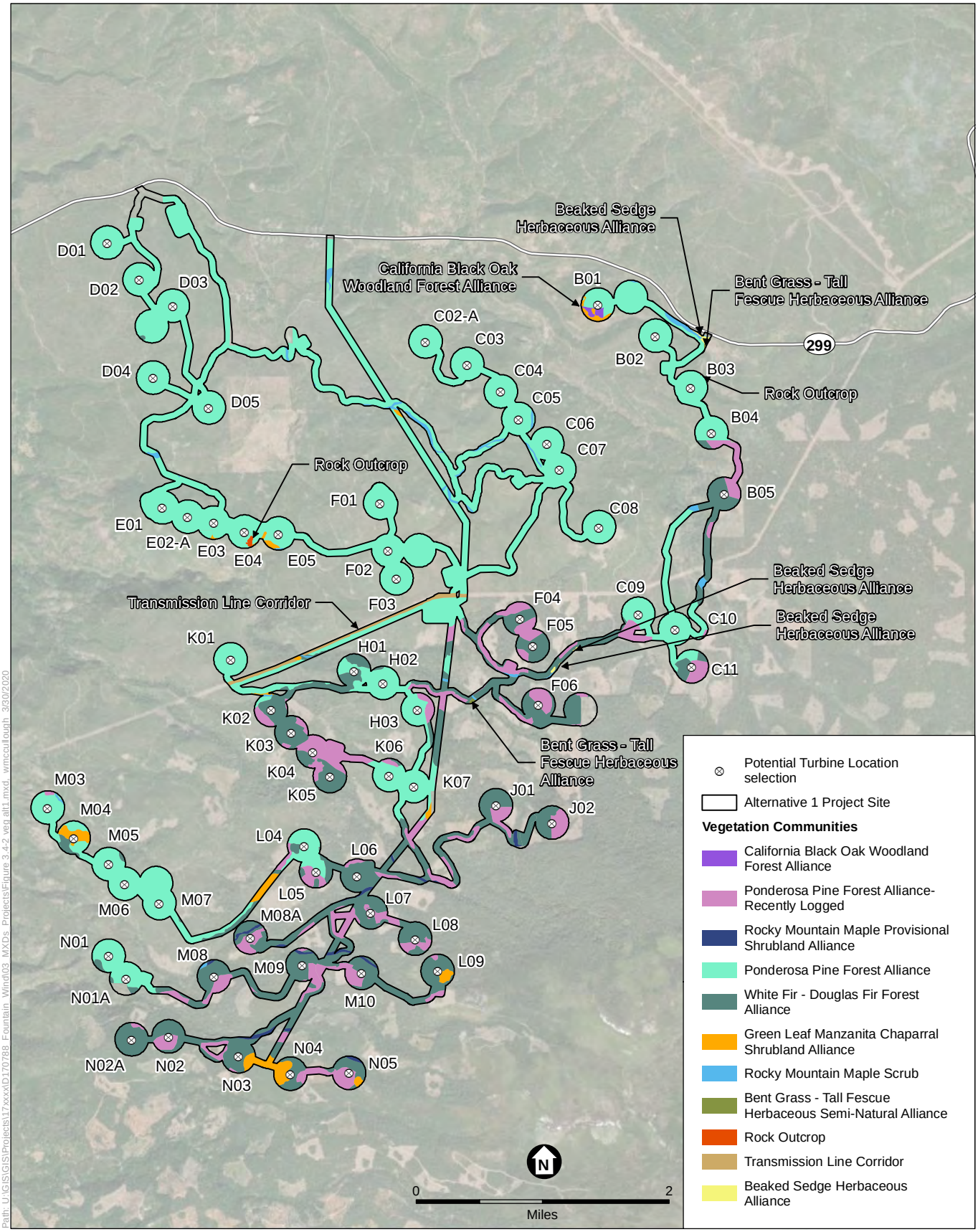
Mitigation: None required.

3.4.3.3 PG&E Interconnection Infrastructure

The Project would include interconnection infrastructure as described in Section 2.4.3, *Project Substation, Switching Station and Interconnection Facilities*. These elements would include both overhead and underground collection system. Overhead collector systems (rather than trenched construction) would be implemented for stream and wetland crossings, to avoid steep terrain, and for other sensitive resource avoidance areas. Construction of the substation, switching stations, and interconnection components would include up to 19 acres of temporary disturbance, and 13 acres of permanent disturbance (including the footprints of the collector substation, switching station, graveled parking and maintenance areas). The proposed location for PG&E interconnection infrastructure is immediately adjacent to the existing PG&E central east-west transmission corridor in under 30-year aged, mixed conifer forest that burned in the 1992 Fountain fire. No sensitive vegetation communities, riparian, wetland or aquatic resources would be directly impacted through construction and operation of the PG&E interconnection infrastructure. The PG&E infrastructure permanent footprint of 13 acres would remove only 0.5 percent of the mixed conifer forest (burned) within the Project Site, and is unlikely to attract non-avian wildlife or hamper wildlife movement corridors through the Project Site and surrounding area. The PG&E infrastructure may contribute to impacts to resident, nesting birds during construction and maintenance and impacts to birds during operation from collision with transmission lines or from electrocution as a result of perching on transmission lines. All other mitigation measures that would be required for the Project also would be implemented to address impacts specifically of the PG&E infrastructure.

Alternative 1: South of SR 299

Under Alternative 1, the Project would be constructed, operated and maintained, and ultimately decommissioned as proposed south of SR 299, and none of the up to seven turbines proposed to the north of SR 299 (turbine numbers A01 through A07) or related infrastructure would be developed. The Alternative 1 Site would consist of the approximately 4,086 acres located south of SR 299, while the approximately 378 acres of the Project Site located north of SR 299 would continue to be managed for timber production (see **Figure 3.4-2**, *Vegetation Communities within the Alternative 1 Site*). Each of Alternative 1's up to 65 turbines could be up to 679 feet above ground level at the top of the blade (the same as the Project) and would have a generating capacity of 3 to 5.7 MW (also the same as the Project). Compared to the Project, this alternative would have 1.8 miles less of new access roads, 4.1 miles less of widening of existing access roads, 2.1 miles less of underground electrical collector lines, and 2.2 miles less of overhead electrical collector lines. Total anticipated temporary construction disturbance areas and expected permanent disturbance areas would be 125.0 acres and 60.5 acres less than the Project, respectively. This is 2.8 percent and 1.3 percent reduction in the expected acres of temporary and permanent disturbance areas within the Project Site (4,464 total acres) respectively. This small reduction in disturbed acres is due to fewer acres of total disturbance from turbines and pads, access roads, overhead and underground electrical collector lines, temporary laydown areas, and other facilities. Since the



SOURCE: WEST Rare Plant & Natural Vegetation Communities Report; 2018/2019

Fountain Wind Project

Figure 3.4-2
Vegetation Communities within the Alternative 1 Site

seven turbines that would not be built are located in the area burned by the 1992 Fountain fire, the largest difference in the acreage of habitats included in the Project Site between Alternative 1 and the Alternative 2 is a reduction in burned mixed conifer forests of 343 acres. There is also expected to be less acreage included in the Project Site of mixed montane riparian scrub (31 acres), and unmapped habitats (3.6 acres). The acres of black oak woodland, mixed montane riparian forests, unburned mixed conifer forests, mixed montane chaparral, montane meadow, and wet montane meadow habitat included in the Project Site would not change. For the purpose of comparison, only changes in impacts to resources that would require mitigation or need additional or less mitigation compared to the Project are detailed below for Alternative 1.

Bald and Golden Eagles, California Spotted Owl, Migratory and Resident Raptors, Sandhill Crane, and Nesting Songbirds

It is estimated that the elimination of 7 turbines (9.7 percent) out of the 72 turbines proposed would likewise reduce the total estimated collision risk to migratory and resident birds, but not substantially so. Under Alternative 1, direct impacts to riparian habitat that may support yellow warbler would be reduced by 31.3 acres, or a 27 percent reduction. Conservation measures for songbirds identified in Impact 3.4-11 would further reduce the less than significant impacts on songbirds. Similarly, operation would pose direct impacts on songbirds through collisions with turbine structures during operation of the 40-year term of the requested conditional use permit. Although some impacts may be reduced under Alternative 1, the same types of impacts would occur, and would be addressed by the same mitigation measures. Therefore, as with the Project, the mitigation measures from Section 3.4.3.2 would be implemented and would help to reduce impacts on birds. Following the implementation of Mitigation Measures 3.4-2, 3.4-3a, 3.4-3b, 3.4-3c, 3.4-4, 3.4-6 and 3.4-8, as with the Project, Alternative 1 would offset the impacts of Project operations on bald and golden eagles, and resident and migratory raptors by documenting any moralities and providing adaptive management to respond to avian fatalities. However, due to the uncertainty associated with the Project turbine size and wind-swept area, the raptor impact estimates, and the potential for unexpectedly higher raptor mortality rates, impacts on bald and golden eagles and other raptors would remain significant and unavoidable. Implementing the above-identified mitigation measures, and conservation measures identified in Impacts 3.4-5 (California spotted owl), 3.4-10 (greater sandhill crane), and 3.4-11 (songbirds) would reduce operations-related impacts to the maximum extent practicable.

Bats

Although Alternative 1 would entail somewhat less surface disturbance, less loss of wildlife habitat, and less potential impact to special-status species due to the removal of seven turbines and associated roads, the nature of the impacts would remain the same, and the same mitigation measures would need to be implemented to reduce potential impacts below established thresholds. Therefore, the mitigation measures outlined in Section 3.4.3.2 would be implemented for Alternative 1. Impacts to bats would be reduced but could still be potentially significant and unavoidable.

Sensitive Vegetation Communities and Riparian Habitats

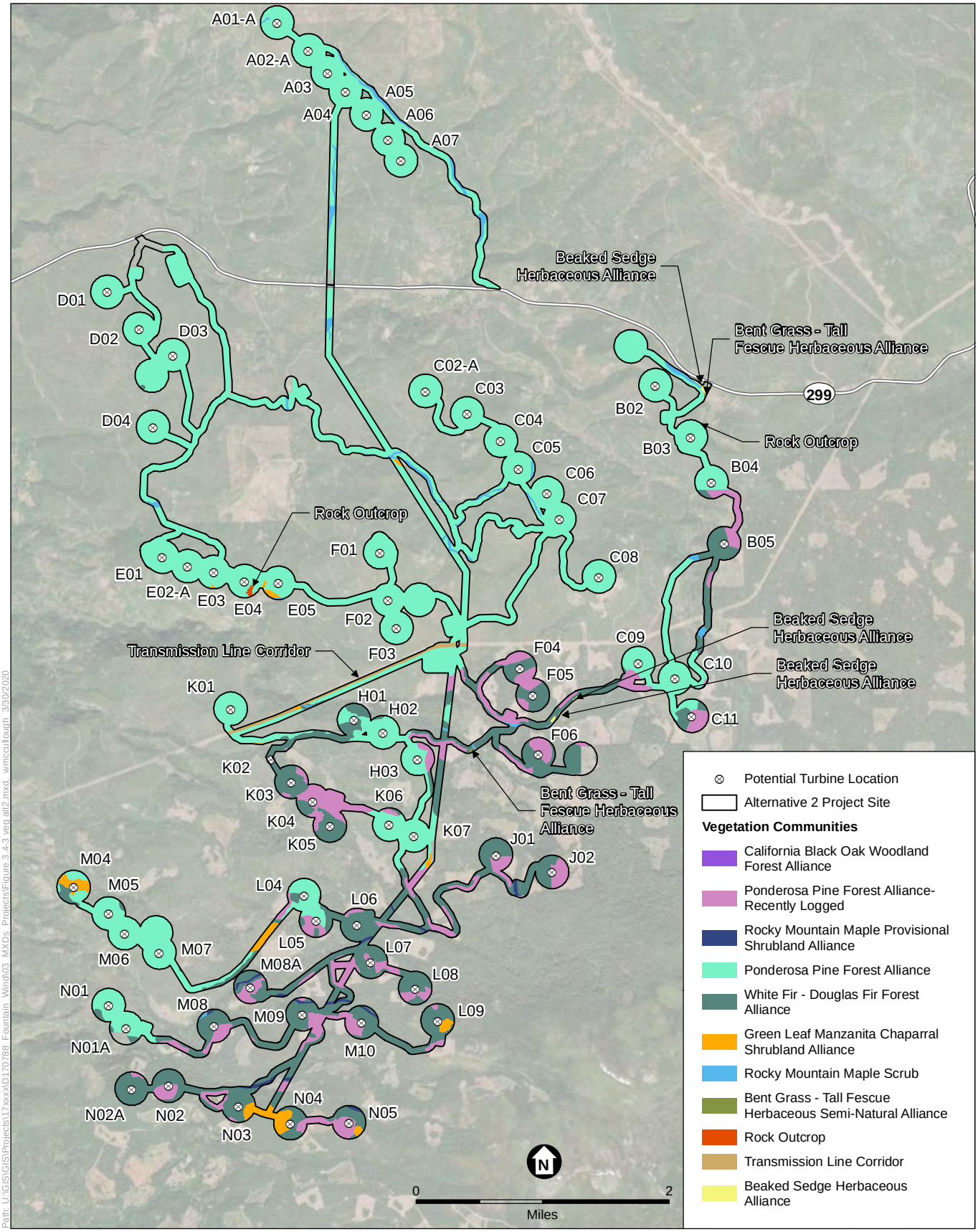
Alternative 1 would directly impact the same vegetation communities as the Project but would reduce the development footprint by 377.9 acres, or 8.5 percent. Under Alternative 1, direct impacts to sensitive vegetation community Rocky Mountain Maple Riparian Scrub would be reduced by 31.3 acres (76 acres of disturbance), or a 27 percent reduction compared to the Project. Although reduced under Alternative 1, impacts to sensitive vegetation would still occur and Mitigation Measure 3.4-16c (Compensate for Impacts to Wetlands and other Waters) would need to be implemented to reduce construction-related disturbances and impacts to a less than significant level.

Aquatic Resources

Alternative 1 would entail less surface disturbance and less potential impact to aquatic resources. Although the area of disturbance for the entire Project would be decreased by 377.9 acres, the types of potential impacts would remain the same throughout the remaining Project Site, which contains numerous aquatic resources, including wetlands and other waters. Under Alternative 1 approximately 2.11 acres of wetlands and 1.33 acres of other waters would be permanently impacted, a slight decrease relative to the Project. As with the Project, Mitigation Measures 3.4-16a and 3.4-16b would be implemented to reduce construction and decommission-related disturbances and impacts related to temporary indirect impacts to aquatic resources from the Project Site to a less than significant level.

Alternative 2: Increased Setbacks

Under Alternative 2, proposed setbacks would be increased relative to the Project to preclude turbine construction within three times the height of the turbine (i.e., within 2,037 feet) of a residential property line and within 1.5 times the height of the turbine (i.e., within 1,018.5 feet) of SR 299, any other publicly-maintained public highway or street, and of Supan Road or Terry Mill Road (see **Figure 3.4-3**, *Vegetation Communities within the Alternative 2 Site*). Implementation of these setbacks would preclude construction of proposed turbines M03, D05, and B01 based on the residential property line setback, and would preclude turbine KO2 based on the roadway setback. Related infrastructure and work areas for these four turbines (including temporary turbine construction areas, access roads and crane roads) would not be needed. The remaining turbines, infrastructure and other improvements would be the same as proposed for the Project. Compared to the Project, Alternative 2 would have 1.0 mile less of new access roads, 4.1 miles less of widening of existing access roads, 2.1 miles less of underground electrical collector lines, and 2.2 miles less of overhead electrical collector lines. Total anticipated temporary construction disturbance areas and expected permanent disturbance areas would be 125.0 and 60.5 acres less than the Project, respectively. This is a 2.8 and 1.3 percent reduction in the expected acres of temporary and permanent disturbance areas within the Project Site (4,464 total acres) respectively. This total disturbance area is identical to Alternative 1. This small reduction in disturbed acres is due to fewer acres of total disturbance from turbines and pads, access roads, overhead and underground electrical collector lines, temporary laydown areas, and other facilities. Since the four turbines that would not be built are located in the area burned by the 1992 Fountain fire, the largest difference in the acreage of habitats included in the Project Site between Alternative 2 and the Project is a reduction in burned mixed conifer forests of



SOURCE: WEST Rare Plant & Natural Vegetation Communities Report; 2018/2019

Fountain Wind Project

Figure 3.4-3
Vegetation Communities within the Alternative 2 Site

100.5 acres. There is also expected to be less acreage included in the Project Site of black oak woodland (5.5 acres), unburned mixed conifer forest (12.4 acres), mixed montane chaparral (6.9 acres), and mixed montane riparian scrub (1.7 acres). The acres of mixed montane riparian forests, montane meadow, and wet montane meadow habitat included in the Project Site would not change.

For the purpose of comparison, only changes in impacts to resources that would require mitigation or need additional or less mitigation compared to the Project are detailed below.

Bald and Golden Eagles, California Spotted Owl, Migratory and Resident Raptors, Sandhill Crane, and Nesting Songbirds

Since the four turbines that would not be built are located in the area burned by the 1992 Fountain fire, the largest difference in the acreage of habitats included in the Project Site between Alternative 2 and the Project is a reduction in burned mixed conifer forests of 100.5 acres. This reduction of impacts to this habitat type would have little benefit to raptors as it is likely few raptors nest in this area. In addition, the reduction of 4 turbines out of the 72 (5.5 percent) turbines would reduce the collision risk to migratory and resident raptors, but not substantially. Under Alternative 2, direct impacts to riparian habitat would be reduced by 1.7 acres, or 1 percent of suitable habitat for the yellow warbler. Similarly, operation would pose direct impacts to songbirds through collisions with turbine structures during operation of the 40-year term of the requested conditional use permit. Although some impacts may be reduced under Alternative 2, the same mitigation measures would apply. Conservation measures identified in Impacts 3.4-5 (California spotted owl) and 3.4-10 (greater sandhill crane) would further reduce less than significant operations-related impacts to these species.

Following the implementation of Mitigation Measures 3.4-2, 3.4-3a, 3.4-3b, 3.4-3c, 3.4-4, and 3.4-6, and 3.4-8, as with the Project, Alternative 2 would reduce impacts of Project operations on resident and migratory raptors by documenting any moralities and providing adaptive management to respond to avian fatalities. However, due to the uncertainty associated with the Project turbine size and wind-swept area, the raptor impact estimates, and the potential for unexpectedly higher raptor mortality rates, impacts on bald and golden eagles and other raptors would remain significant and unavoidable.

Bats

Although Alternative 2 would entail somewhat less surface disturbance, less loss of wildlife habitat, and less potential impact to special-status species due to the removal of four turbines and associated roads, the nature of the impacts would remain the same, and the same mitigation measures would need to be implemented to reduce potential impacts below established thresholds. Therefore, the mitigation measures outlined in Section 3.4.3.2 would be implemented for Alternative 2 and would reduce construction-related and operational disturbances and impacts to local bat populations and their habitats. However, impacts could be considered significant and unavoidable.

Sensitive Vegetation Communities and Riparian Habitats

Alternative 2 would directly impact the same vegetation communities as the Project, except for California black oak woodland, which would be excluded, reducing the Project footprint by 137.6 acres or 3.1 percent. Under Alternative 2, direct impacts to sensitive vegetation community Rocky Mountain Maple Riparian Scrub, a riparian habitat, would be reduced by 1.7 acres (105.6 acres of disturbance), or 1 percent compared to the Project. The implementation of Mitigation Measure 3.4-16c (Compensate for Impacts to Wetlands and other Waters) would reduce construction-related disturbances and impacts to a less than significant level.

Aquatic Resources

Although Alternative 2 would entail somewhat less surface disturbance, 2.22 acres of wetland and 1.33 acres of other waters would be permanently impacted, the same area as under the Project. Because the impacts would remain the same, the same mitigation measures would need to be implemented to reduce these potential impacts. Therefore, Mitigation Measures 3.4-16a and 3.4-16b would be implemented reduce construction and decommission-related disturbances and impacts related to temporary indirect impacts to wetlands and other waters in the Project Site to a less than significant level.

No Project Alternative

If the No Project Alternative is implemented, none of proposed wind turbines or associated infrastructure or facilities would be constructed, operated and maintained, or decommissioned on the Project Site. The proposed overhead and underground electrical collector system and communications lines would not be developed. No disturbance, noise, attractants, or collision hazards would be introduced to the Project Site relative to baseline conditions. The Project Site would continue to be operated as managed forest timberlands. No impacts would result from the No Project Alternative.

3.4.4 Cumulative Analysis

3.4.4.1 Geographic Extent/Context

The geographic scope for the analysis of cumulative impacts to biological resources includes Shasta County and adjacent migration and movement corridors, including local rivers and streams and the portions of the Pacific Flyway for migratory birds proximate to the Project site. This cumulative impact analysis considers past, present and reasonably foreseeable future actions that will or could contribute impacts that are similar in nature to those of the Project and that overlap geographically and temporally with impacts of the Project. The discussion of existing environmental conditions (as described in Section 3.4.1.2, *Environmental Setting*) reflects ongoing impacts of past projects, including past timber harvests.

The incremental impacts of the Project to biological resources are disclosed in Section 3.4.3, *Direct and Indirect Effects*. In summary, they include the temporary and permanent loss of habitat, avian and bat mortality, loss of individuals of certain special-status wildlife species, and temporary construction impacts. The operational impact on raptors is considered significant and

unavoidable. A cumulative impact to biological resources would occur if the Project, combined with all past, present, and reasonably foreseeable cumulative projects in the vicinity of each resource being evaluated, would result in: (1) regulated biological resources becoming limited in extent within the cumulative analysis area; (2) population declines of special-status wildlife resources within the cumulative analysis area; or (3) if compensation for those impacts cannot be achieved.

3.4.4.2 Existing Cumulative Conditions

The 100 MW Hatchet Ridge Wind Project is the only existing wind energy project in the cumulative scenario (Section 3.1.3.1, *Cumulative Scenario*). There are no other wind energy projects currently proposed in Shasta County. The 2007 Hatchet Ridge Wind Project EIR identified significant and unavoidable impacts to greater sandhill cranes, bald eagles, and special-status raptors and other avian species; however, post-construction avian fatality monitoring has not identified any sandhill crane or bald eagle mortalities resulting from that project. Given the close proximity of the Hatchet Ridge project site to the Project Site and the similarity of the two wind energy generation efforts, similar impacts are anticipated to avian species.

Aside from wind projects, other reasonably foreseeable projects in Shasta County include 25 projects that either have applied for or have received approval to proceed. Among them are requests for or implementation of use permits and reclamation plans for mining operations, which would not pose collision hazards to avian species; relatively short towers or poles for cellular and radio uses that could have limited and localized impacts related to avian collisions; timber harvest plans, which would be performed in conformance with federal and state regulations protecting nesting birds and would not substantially reduce habitat for avian species; and urban development, mostly in urban centers, which would have limited impacts on biological resources.

3.4.4.3 Construction, Operations, and Decommissioning

Direct impacts to wildlife as a result of the Project include temporary and permanent loss of habitat along with the displacement and/or potential mortality of mostly common wildlife species that are poor dispersers such as snakes, lizards, and small mammals. The combined effect of impacts to common wildlife species (i.e., species with no special status) from the Project and impacts of the cumulative projects is considered less than significant because the potentially affected area is largely undeveloped and the species are common and wide-ranging within it.

Collision Risk

Impact 3.4-18: The Project could cause a cumulatively considerable contribution to a significant cumulative impact to avian and bat species from collisions with Project infrastructure. (*Significant and Unavoidable*)

Resident and migratory bird and bat species are at risk of collision with features of the Project as well as past, current, and reasonably foreseeable projects in the cumulative scenario. Cumulative projects that could contribute to a collision risk include the Hatchet Ridge Wind Project and three tower projects: Cellular Tower Use Permit use permit (County project #UP18-0006), Hat Creek

Radio Observatory (project #AMND18-0004), and the T-Mobile Wireless Mono Pole (project #UP19-0005). These projects are located in relatively undeveloped areas and have the potential to pose risks to birds and bats during operations resulting from collisions with overhead transmission lines, utility poles, wind turbines, turbine towers, and meteorological towers.

Project-level impacts related to collisions with infrastructure were identified for raptors species (e.g., red-tailed hawk, sharp-shinned hawk, Cooper's hawk, northern goshawk, bald eagle, and golden eagle), and special-status bat species. These impacts, combined with losses associated with past, present, and future projects are considered a significant cumulative impact to these bird and bat species because the impacts have the potential to limit the populations of the species within the cumulative impacts analysis area. For this reason, the cumulative impact is considered significant. As discussed below, the Project's incremental contribution to this significant cumulative effect would not be cumulatively considerable.

For goshawk, no recent breeding activity has been locally described locally and low number of goshawks have been detected at the Project Site or the Hatchet Ridge project site. Sandhill cranes do not use the Project Site for roosting and breeding, and but sandhill cranes have been detected at the Project Site and the Hatchet Ridge project site during migration. Use of the Project Site by smaller bat species is limited, and mortality from turbines appears low at Hatchet Ridge, compared to other wind facilities. Several conservation measures are suggested to further reduce several less than significant impacts to California spotted owl, nesting songbirds and greater sandhill crane, include conservation measures for Impact 3.4-11 (Conservation Measure for Nesting Songbirds; Conservation Measure for Vaux's Swift, and Conservation Measure for Willow Flycatcher and Yellow Warbler), one conservation measure for Impact 3.4-10 (Sandhill Crane Conservation Measure), and one conservation measure for Impact 3.4-5 (California Spotted Owl Conservation Measure).

The Project and similar cumulative projects would be required to minimize potential avian and bat impacts by implementing mitigation measures. For the Project, these include Mitigation Measures 3.4-3.4-3b (Monitor Avian and Bat Mortality Rates During Project Operations), 3.4-3c (Offset Operational Impacts on Eagles through Compensatory Mitigation, if Necessary). Implementation of these mitigation measures would reduce the Project's contribution to this cumulative impact for most avian species and bats; however, due to the uncertainty associated with eagle, other raptor and bat mortality estimates and the potential for unexpectedly high mortality rates, this impact would not be reduced to less than significant under CEQA. In other words, the Project could have a cumulatively considerable (significant) contribution to a significant cumulative effect to eagles, other raptors and bat species based on the uncertainty associated with mortality estimates and the potential for unexpectedly high mortality rates and the uncertainty regarding whether cumulative impacts could result in population-level declines in these species. Because no additional reasonable, feasible mitigation measures are available that, if implemented, would reduce the Project's contribution below the established level of significance, the Project's contribution to this impact would remain significant and unavoidable.

Electrocution Risk

Overhead transmission lines associated with the Project and the Hatchet Ridge Wind Project also pose an electrocution risk for avian species, particularly for large, aerial perching birds such as hawks and eagles, because of their large wingspan (APLIC, 2006). Impacts to golden eagle and other raptors associated with the Project combined with losses of individual birds from electrocution associated with past, present, and future projects are considered a significant cumulative impact to these species because the impacts have potential to limit the populations of the species within the cumulative impacts analysis area. For this reason, the impact would be considered significant under CEQA. For the Project, potential impacts associated with electrocution would be minimized through the proposed adherence to APLIC guidance for new power poles and transmission lines. The Hatchet Ridge Wind Project also incorporates APLIC design guidelines to reduce potential electrocution impacts. Implementation of the Project's mitigation measures would reduce the Project's contribution to this cumulative impact such that it would not be cumulatively considerable.

Waters of the U.S. and Sensitive Natural Communities

Construction activities associated with the Project could result in the temporary and/or permanent placement of fill material into waters of the United States, including wetlands. The Hatchet Ridge Wind Project is the only other project in the cumulative scenario with identified impacts to sensitive natural communities; and the project-level and cumulative impacts to these resources were considered less than significant and fully mitigated following project implementation. Under the Project, 37.96 acres of wetlands and other waters were identified in the study area, of which a small portion would be subject to temporary or permanent impacts. The actual acreage of impacts would be refined and likely significantly reduced during project design, engineering, and permitting. Similarly, a portion of the identified Rocky Mountain Maple Riparian Scrub natural community within the study area would be impacted during Project construction. This natural community is likely not subject to impacts from other projects in the cumulative scenario. For the Project, potential impacts the loss of waters of the U.S. and sensitive natural communities would be minimized through implementation of Mitigation Measures 3.4-16b (Avoid and minimize impacts to wetland and other waters) and 3.4-16c (Compensate for Impacts to Wetlands and other Waters). The Hatchet Ridge Wind Project also implemented mitigation measures to minimize and fully mitigate losses of waters of the U.S., including wetlands and sensitive natural communities. Implementation of the Project's mitigation measures would reduce the Project's contribution to this cumulative impact such that it would not be cumulatively considerable.

When considered in combination with the impacts of other projects in the cumulative scenario, the Project's incremental contribution to avian and bat mortality and impacts to sensitive natural communities would not be cumulatively considerable because implementation of Project's mitigation measures would reduce the impacts to less than significant under CEQA.

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3.5 Communications Interference

This section identifies and evaluates issues related to Communications Interference in the context of the Project and alternatives. It includes the physical and regulatory setting, the criteria used to evaluate the significance of potential impacts, the methods used in evaluating these impacts, and the results of the impact assessment.

Communications Interference is not a topic typically addressed in the County's CEQA analyses. However, the County has elected to address potential interference with communications as a potential impact on the physical environmental impact in this EIR in light of the critical function of communications in emergency response, which is a public safety topic that is addressed under CEQA, and because interference with cell, radio, television, and other communications could adversely affect human health and the physical environment if emergency response communications were prevented, interrupted or delayed. Also, as summarized below, the County received scoping comments expressing concern about the potential for the Project to cause interference with communications (see **Appendix J**, *Scoping Report*). The analysis in this section addresses those comments.

Frontier Communications provided initial input for the County's environmental review process shortly after the CUP application was filed for the Project. In it, the company confirmed that it has existing facilities along State Route (SR) 299 (Frontier Communications, undated). Later, in response to the issuance of notice of intention to prepare this Draft EIR, the County received scoping input about the potential for Project components (e.g., wind turbines or meteorological towers) to cause communications interference that adversely affects residents' and others' ability to coordinate with emergency service providers via cell phone, 2-way radio, landlines, or the internet. One comment also asked about potential interference with television reception. Concerns were raised specifically regarding potential interference with the communications infrastructure and communications needs of the Shasta Area Safety Communications Agency (SHASCOM), California Highway Patrol (CHP), air ambulance service providers such as PHI and REACH, aviation companies that use the flight path over the proposed site, and Valley Industrial Communications, which repairs and handles repeaters and radio problems for public safety entities such as the Sherriff's Office and SHASCOM. All scoping input received, including regarding communications interference, is provided in Section 4.1 of the Scoping Report (Appendix J).

This section relies in part on the information provided by the communications interference engineering report prepared on behalf of the County for this Project by Evans Engineering Solutions. A copy of the report is provided in **Appendix D**, *Communications Interference*. The report describes the results of a study to determine the locations of FCC-licensed microwave and fixed station radio frequency facilities that may be adversely impacted as a result of the construction of wind turbines at the Project Site and an analysis to determine whether interference is likely to occur.

3.5.1 Setting

3.5.1.1 Study Area

The study area relevant to the analysis of communications interference includes the potential impact zone for Project interference on communications signals. The study areas and database search distances relevant to different types of communications signals are summarized in **Table 3.5-1**, and their relevance is explained in more detail in Section 3.5.2.2, *Environmental Setting*.

TABLE 3.5-1
STUDY AREAS AND DATABASE SEARCH DISTANCES FOR RELEVANT COMMUNICATIONS TYPES

Communications Type	Study Area and/or Database Search Distance	Rationale for Study Area/Search Distance
Land mobile/public safety radio transmitter stations	About 1,400 feet	Wind-turbine-caused interference at land mobile transmitter stations typically occurs only within 425 meters or about 1,400 feet of a turbine site.
Satellite earth stations	65 miles	Impact potential depends on satellite arc; 65 miles encompasses any stations that could have impacts.
AM broadcast facilities	1.8 miles	Large metallic structures such as wind turbines can adversely affect the transmitted signals of AM broadcast stations up to 3 kilometers (1.8 miles) away.
TV broadcast facilities	3 miles	About 10 percent of receiver locations can be affected to some extent within 3 miles of a large turbine when the turbine is between the TV station and the receiver.
Aircraft navigation	10 miles	Interference with aircraft navigational communications is not anticipated from structures more than 10 miles from a navigational radio beacon.
Microwave and cellular communications	Study area is a modeled zone described in Section 3.5.3.1 Search radius for microwave towers is 2 miles	The “first Fresnel zone” of microwave signal paths is the zone in which microwave transmissions travel from the point of origin to a receiver. A search radius of 2 miles from the Project Site encompasses all towers within any of the modeled first Fresnel zones.

SOURCE: Appendix D; Angulo et al., 2014.

3.5.1.2 Environmental Setting

Radio and Television Communication

Four types of radio and television communications facilities are considered in this section: land mobile/public safety radio transmitter stations (“land mobile stations”), satellite earth stations, AM broadcast stations, and television broadcast facilities.

Although the engineering report used a database search area of 2 miles, it indicates that wind-turbine-caused interference at land mobile transmitter stations typically occurs only within

425 meters or about 1,400 feet of a turbine site; this distance is referred to as the "worst-case recommended setback" from land mobile stations. The closest station to a proposed turbine location is 592 meters (about 1,950 feet) from Turbine M08 (Appendix D). The known locations of land mobile stations near the Project Site are outside the area of potential impact.

The report also identified one FCC-authorized satellite earth station whose range extends across the Project Site. It is located about 37 kilometers (23 miles) from the nearest proposed turbine location (B03), and its signal would be clear of the turbine's blades by over a mile in vertical distance, and would therefore be outside of the three-dimensional impact area for the Project.

Large metallic structures such as wind turbines can adversely affect the transmitted signals of AM broadcast stations up to 3 kilometers (1.8 miles) away. There are no AM broadcast facilities within 1.8 miles of the Project Site; therefore, no such facilities would be within the impact area for the Project (Appendix D). Because none of these facility types would be close enough to experience impacts from the Project, land mobile stations, satellite earth stations, and AM broadcast facilities are not discussed further.

Finally, television broadcast signals can be interrupted when the direct path from a broadcast station to a television viewer's residence or other receiver is reflected by turbine blades, and the engineering report indicates that typically, approximately 10 percent of the receiver locations could be affected to some extent within 3 miles of a large turbine when the turbine is between the TV station and the receiver (Appendix D). Up to 22 television broadcast stations currently are licensed to send broadcast signals through or immediately adjacent to the Project Site,[1] and these stations serve customers in an area of approximately 215 square miles surrounding the Project Site.

Aircraft Navigational Systems

There are three public airports in Shasta County: the Redding Municipal Airport, Benton Airpark, and Fall River Mills Airport. The nearest airport to the Project Site, the Fall River Mills Airport, is located approximately 20 miles northeast of the Project Site. There are no nearby airports operated by the U.S. Military.

The Fall River Mills Airport and Benton Airpark have Common Traffic Advisory Frequency (CTAF) radio communication capability, but no tower and aircraft instrumentation systems (AirNav.com, 2020a, 2020b). Radio transmissions are addressed above, and as noted, known radio signals are located outside the potential impact area of the Project and are not addressed further.

The Redding Municipal Airport has a Very High Frequency Omni-Directional Range (VOR) aircraft navigational radio system that supports instrumented aviation and is maintained by the Federal Aviation Administration (FAA) (AirNav.com, 2020c). Although interference with VOR communications is not anticipated from structures more than 10 miles (15 kilometers) from a

[1] Up to 13 of these 22 stations are currently off the air and target dates for return to operation are unknown (Appendix D).

beacon (Angulo et al., 2014) and the Redding Municipal Airport is over 35 miles from the Project Site, aircraft navigational systems are addressed in the impact analysis because the Applicant would be required to file a notice with the FAA to determine potential effects on navigation signal reception as explained in Section 3.5.1.3, regardless of this distance.

Cellular Phone and Microwave Communication

Microwaves are a type of electromagnetic wave used to carry information such as radio, cellular phone, and digital communications at high speeds. Microwaves travel along direct line-of-sight paths and their transmission requires the use of multiple towers to receive, amplify, and re-transmit signals over long distances. The engineering report identified 72 licensed microwave paths within 2 miles of the Project Site, many of which cross the Project Site near the proposed locations of turbines. Licensees include but are not limited to Pacific Gas and Electric Company (PG&E), the State of California, Citizens Telecom Company of California, Southern Oregon University, New Cingular Wireless, Transmission Agency of Northern California, KCVU-TV, and T-Mobile. Microwave transmissions can be obstructed if structures such as wind turbines or buildings interrupt these line-of-sight paths or cause reflections of signals (Appendix D).

SHASCOM provides notifications from local emergency response teams to registered cell phones in the event of emergency situations or critical community alerts. County residents can register their cell phone numbers with SHASCOM's Code Red system to receive emergency notifications like evacuation notices, bio-terrorism alerts, boil-water notices, and missing child reports (SHASCOM, 2020). This notification system is specific to cell phones, is distinct from the County's alert system using landline phones, and was put in place in response to declining landline telephone use as more County residents switched to using cell phones exclusively (Sandhu, 2018).

3.5.1.3 Regulatory Setting

Federal

Federal Communications Commission

The FCC regulates interstate and international communications by radio, television, wire, satellite, and cable. The FCC implements the Communications Act and several commission rules and orders prohibiting radio frequency interference, and addresses complaints from consumers and public safety providers regarding communications interference.

FAA Regulations on Structures Affecting Navigation Signal Reception

The FAA is the federal agency that identifies potential impacts related to air traffic and related safety hazards. The FAA Federal Aviation Regulations (FAR) establish standards and notification requirements for proposed structures that will be in proximity to a navigation facility and may impact the assurance of navigation signal reception. FAA standards (14 CFR Part 77.9) generally require that applicants for any temporary or permanent structure that exceeds an overall height of 200 feet above ground level (as the proposed wind turbines would) or could impact the assurance of navigation signal reception file with the FAA prior to construction to obtain a determination

regarding potential obstructions to air navigation or navigational aids or facilities. This requirement to file a notice with the FAA would apply to the Project (FAA, 2020).

State

California Public Utilities Commission

The CPUC regulates privately owned telecommunications companies and other utilities including several licensees of the cellular and microwave communications signals described in Section 3.5.1.2, such as Pacific Gas & Electric Co. and telephone service providers such as T-Mobile. The CPUC may have regulatory oversight of certain aspects of changes to communications facilities if any are necessary as a result of the Project.

Local

Shasta County Multi-Jurisdictional Hazard Mitigation Plan

The Shasta County and City of Anderson Multi-Jurisdictional Hazard Mitigation Plan identifies communications as one of the "utility lifeline systems" deemed critical facilities by the Federal Emergency Management Agency (FEMA). Critical facilities are those in either the public or private sector that provide essential products and services to the general public, are otherwise necessary to preserve the welfare and quality of life in the region, or fulfill important public safety, emergency response and/or disaster recovery functions (Shasta County and City of Anderson, 2017).

3.5.2 Significance Criteria

Neither CEQA nor the CEQA Guidelines discusses interference to communications as a topic for analysis in CEQA documents. Nonetheless, as described above, the County chooses to address potential interference with communications as an environmental impact in this EIR. Accordingly, for purposes of this EIR, project would result in a significant impact to Communications Interference if it would:

a) Cause substantial interference to existing television and radio reception at residences in the vicinity;

b) Substantially interfere with existing navigational systems operated by the Federal Aviation Administration (FAA) or the U.S. military; or

c) Obstruct or prevent point-to-point microwave relay station transmissions that traverse the project site.

3.5.3 Direct and Indirect Effects

3.5.3.1 Methodology

For impacts on television broadcast communications, the 10 percent general rule described in Section 3.5.1.2 was used to estimate the number of households likely to be affected within the 215-square-mile service area of the stations that broadcast over the Project Site.

Microwave transmissions do not travel in perfectly straight lines. Each wave travels along an arc, and the arcs from multiple waves in a transmission form an ellipsoidal[2] shape between the transmitter and a receiver. For impacts on microwave communications, Evans Engineering Solutions created three-dimensional models of each proposed turbine and modeled the ellipsoidal zones in which microwave transmissions from known transmitters travel from the point of origin to a receiver (called a "Fresnel zone"). To determine whether the Project could have an adverse effect on microwave communications, the three-dimensional turbine models and Fresnel zones of microwave transmission paths were compared to determine whether these modeled shapes would intersect. See Appendix D for additional details.

3.5.3.2 Direct and Indirect Effects of the Project

Because the potential for interference on communications signals discussed in this section occurs as a result of the physical presence of wind turbines, any potential impacts would occur primarily during operation and maintenance. Impacts would begin during the construction phase as turbines are installed, and would persist through decommissioning for as long as turbines remain in place. However, the site clearing and reclamation phases, and the construction and decommissioning activities that would occur during those phases, would not affect communications. Therefore, the impact discussions below focus on the operation and maintenance phase.

a) Whether the Project would cause substantial interference to existing television and radio reception at residences in the vicinity.

Impact 3.5-1: The Project could cause intermittent interference to or freezing of television reception at some residences in the service area of the stations that broadcast over the Project Site. (*Less than Significant with Mitigation Incorporated*)

There are an estimated 600 residences within the 215-square-mile service area of the stations that broadcast over the Project Site. The engineering report assumes that about 55 percent of these residences use satellite or cable to receive television, meaning that the remaining 45 percent (270 residences) would rely on "over-the-air" television reception (Appendix D). However, because the County has not independently substantiated this assumption, this analysis conservatively uses a range of 270 to 600 residences relying on "over-the-air" reception. Using the 10 percent rule described in Section 3.5.3.1, an estimated 27 to 60 residences could experience intermittent interference or freezing of television reception as a result of the Project. The impact would be long-term, persisting throughout the life of the Project, but would cease after wind turbines are decommissioned and removed. This would be a significant impact because of the reliance of rural residents on "over-the-air" television broadcasts to receive information.

Mitigation Measure 3.5-1 is proposed to ensure that television interference impacts would be avoided or corrected, reducing the impact to less than significant.

[2] Ellipsoidal here refers to a shape similar to an elongated football.

Mitigation Measure 3.5-1: Correct or mitigate conflicts with television signals.

Prior to issuance of a construction permit from the County, the Applicant shall send notifications, via certified mail or other means that documents receipt, to all property owners of residences within the service area of the stations that broadcast over the Project site notifying them of the potential for interference with "over-the-air" television signals received by antenna. The notification shall provide contact information and instructions so that recipients may file a complaint with the Shasta County Department of Resource Management, Planning Division if interference occurs.

In the event that the County receives a verified complaint regarding television broadcast interference that is attributable to this Project, the Applicant will resolve receiver interference through coordination with property owners. Verification shall include a letter or report from a qualified third party supporting the conclusion that interference is attributable to the Project. The Applicant shall not be required to provide qualifying residents with better reception than they had before the construction and operation of the Project.

Significance after Mitigation: Less than significant.

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b) Whether the Project would interfere with existing navigational systems operated by the FAA or the U.S. military.

Impact 3.5-2: The Project would not interfere with existing navigational systems operated by the FAA or the U.S. military. (*Less-than-Significant Impact*)

Wind turbines have the potential to interfere with VOR aircraft navigational systems. The nearest airport with a VOR navigational system is over 35 miles from the Project Site. Little or no signal interference is anticipated when wind turbines are located more than 10 miles from a VOR beacon location (Angulo et al., 2014). Therefore, the impact would be less than significant.

Nonetheless, the FAA requires that a Notice of Proposed Construction (Form 7460-1) be filed for any object that would extend more than 200 feet above ground level. One aspect of the FAA's review of the Applicant's notice would evaluate the potential physical or electromagnetic effects on air navigation, communication facilities, and other surveillance systems (14 CFR §77.29[6]). Once the Form 7460-1 is reviewed by the FAA, the Applicant must implement measures to reduce any potential impacts on aircraft navigation in accordance with the requirements of FAA's analysis of the Form 7460-1. It is unlikely that the Project would cause physical or electromagnetic interference with aircraft navigational systems due to the distance to the nearest airport (Appendix D). However, if the FAA identifies potential effects, then the measures to reduce potential impacts may include an operational curtailment agreement (i.e., to bring turbines causing interference to a temporary stop) based on air navigation schedules may be negotiated, or the FAA could negotiate with the Applicant to fund upgrades to the existing potentially affected radar system (Department of Energy, 2016). Implementation of such legally required measures, if any are identified, also would ensure that this impact would remain less than significant.

Mitigation: None required.

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c) Whether the Project would obstruct or prevent point-to-point microwave relay station transmissions that traverse the Project Site.

Impact 3.5-3: None of the Project turbines would obstruct or prevent known point-to-point microwave relay station transmissions; however, interference could occur due to turbine location adjustments or currently unknown transmissions. (*Less than Significant with Mitigation Incorporated*)

As explained in Section 3.5.1.2, microwaves carry information such as radio, cell phone, and digital communications. The engineering report (Appendix D) found that none of the Project turbines would intersect with the Fresnel zones of the known microwave paths that cross the Project Site; therefore, they would not obstruct or prevent point-to-point microwave transmissions. No impact would occur based on the proposed turbine locations and known microwave paths.

However, as noted in the engineering report, although the third party and FCC databases relied on for this analysis typically are very accurate, it is possible that some microwave facilities have not been accurately represented, and that interference could occur. Additionally, if wind turbine siting were to be adjusted during final design, it is possible that wind turbines could overlap with the transmission zones. Either scenario could result in interference with microwave transmissions, which could result in a significant impact on County residents and public safety because these transmissions are frequently used for emergency communications. If such an impact were to occur, it would be long-term, persisting throughout the life of the Project, but would cease after wind turbines are decommissioned and removed.

Therefore, while no significant impact is anticipated based on information known at the time of this analysis, Mitigation Measure 3.5-3 is proposed to ensure that microwave interference impacts would be avoided or corrected, reducing the impact to less than significant.

Mitigation Measure 3.5-3: Correct or mitigate conflicts with microwave signals.

Prior to issuance of a construction permit from the County, the Applicant shall notify, via certified mail or other means that documents receipt, all owners of frequency-based communication stations and towers within 2 miles of the Project Site. The notification shall provide the locations of all turbines and shall provide contact information and instructions so that recipients may file a complaint with the Shasta County Department of Resource Management, Planning Division if interference occurs.

In the event that the County receives a verified complaint regarding microwave transmission interference that is attributable to this Project, the Applicant will resolve receiver interference through coordination with owners of frequency-based communication stations and towers. Verification shall include a letter or report from a qualified third party supporting the conclusion that interference is attributable to the Project. Possible actions include the Applicant being responsible for installation of high-performance antennas at nearby microwave sites, if required. The Applicant shall not be

required to provide qualifying owners with better signals than they had before the construction and operation of the Project.

Significance after Mitigation: Less than significant.

3.5.3.3 PG&E Interconnection Infrastructure

The PG&E interconnection infrastructure described in Section 2.4.3 would be substantially shorter in height than the proposed wind turbines, and so would have commensurately less potential to cause communications interference. This infrastructure would not contribute to potential interference with microwave and cellular communications or television broadcast signals because the structures would be much smaller than the wind turbines and would not involve the movement of turbine blades. Additionally, the PG&E facilities could require a relay microwave tower or overhead fiber optic communication circuits; however, these facilities would be designed to avoid or minimize interference with existing communication facilities. Therefore, impacts on these communication types would be less than significant and Mitigation Measures 3.5-1 and 3.5-3 would not apply to the PG&E interconnection infrastructure. The minor modifications or upgrades to the existing 230 kV line and the additional poles needed to connect the Project switching station would not involve structures taller than 200 feet and thus would not need FAA review for navigation interference. The impact related to navigational communications also would be less than significant.

3.5.3.4 Direct and Indirect Effects of Alternatives

Alternative 1: South of SR 299

Under Alternative 1, fewer turbine locations would be developed (with A01 through A07 omitted), and all of the turbine locations included in this alternative would be at least as far away from land mobile/public safety radio transmitter stations, earth satellite stations, AM broadcast facilities, television broadcast facilities, aircraft navigation beacons, and microwave and cellular communication facilities as described for the Project. Therefore, the potential impacts on television reception (Impact 3.5-1), aircraft navigation (Impact 3.5-2), and microwave and cellular communication (Impact 3.5-3) would be the same as described for the proposed Project, although there may be a small reduction in the potential for unforeseen microwave communication interference because the turbines north of SR 299 would not be constructed (turbines A01, A02, and A03 are some of the closest to known microwave paths, as identified in Appendix D, but would not interfere with the Fresnel zones of these paths and so are not expected to cause interference). Mitigation Measures 3.5-1 and 3.5-3 would apply to Alternative 1 and would reduce impacts 3.5-1 and 3.5-3 to less-than-significant levels, respectively.

Alternative 2: Increased Setbacks

Under Alternative 2, fewer turbine locations would be developed (with B01, D05, K02, and M03 omitted), and all of the turbine locations included in this alternative would be at least as far away from land mobile/public safety radio transmitter stations, earth satellite stations, AM broadcast

facilities, television broadcast facilities, aircraft navigation beacons, and microwave and cellular communication facilities as described for the Project. Therefore, the potential impacts on television reception (Impact 3.5-1), aircraft navigation (Impact 3.5-2), and microwave and cellular communication (Impact 3.5-3) would be the same as described for the proposed Project, although there may be a small reduction in the potential for unforeseen microwave communication interference because several turbines would not be constructed (turbine D05 is one of the closest to known microwave paths, as identified in Appendix D, but does not interfere with the Fresnel zones of these paths and so is not expected to cause interference). Mitigation Measures 3.5-1 and 3.5-3 would apply to Alternative 2 and would reduce impacts 3.5-1 and 3.5-3 to less-than-significant levels, respectively.

No Project Alternative

If the No Project Alternative is implemented, none of the proposed wind turbines, meteorological towers, or other related infrastructure would be constructed, operated and maintained, or decommissioned on the Project site. The Project site would continue to be operated as managed forest timberlands. Because there would be no change relative to baseline conditions, the No Project Alternative would create no impact related to Communications Interference.

The Project Site is zoned for timber production. Pursuant to regulations implementing the California Timberland Productivity Act (Government Code §51100 et seq.; 14 Cal. Code Regs. §897[a]), there is a legal presumption that "timber harvesting is expected to and will occur on such lands." The regulations further specify that timber harvesting on such lands "shall not be presumed to have a Significant Adverse Impact on the Environment" (14 Cal. Code Regs. §898). Therefore, the No Project Alternative, including anticipated timber harvesting, is not presumed to result in a significant adverse individual or cumulative effect.

3.5.4 Cumulative Analysis

Although a potential less-than-significant impact on aircraft navigational systems is identified under Impact 3.5-2, the Project ultimately would avoid any impacts on navigation and could not contribute to a cumulative impact on aircraft navigational systems because the Project would be required by law to comply with the requirements of FAA's analysis of impacts on navigation prior to construction and operation of the Project. For this reason, neither the Project nor an alternative would cause or contribute to a potential cumulatively significant impact in this regard.

The geographic scope for cumulative effects related to television reception includes the 215-square mile combined service area of the stations that broadcast over the Project Site. For impacts on microwave and cellular transmissions, the geographic scope includes the extent of the paths crossing the Project Site; this includes transmission stations at either end of each path. The temporal scope of impacts on both types of transmissions includes the time from initial construction of any turbine causing interference to full resolution of the interference as required by Mitigation Measures 3.5-1 and 3.5-3.

The existing Hatchet Ridge Wind Project site is located about 6 miles east of the Project Site and is crossed by some of the same television broadcast signals that cross the Project Site. As explained under Impact 3.5-1, the Project could cause intermittent interference to television reception, a potentially significant impact before mitigation. The existing wind turbines at Hatchet Ridge already have been evaluated in the EIR for that project and their role in television broadcast transmission interference addressed by implementation of Mitigation Measure USS-1, which required notification and correction of interference similar to what is required under Mitigation Measure 3.5-1 for the proposed Project (Shasta County, 2008). Therefore, the existing Hatchet Ridge Wind Project would not cause interference with the same television broadcast signals during the same timeframe that the Project could cause interference, and the two projects' impacts would not combine to result in a significant cumulative impact.

The existing Hatchet Ridge Wind Project is located within an area crossed by the same microwave paths that cross the Project Site, which include paths licensed to the State of California, PG&E, Citizens Telecom of California, Southern Oregon University, New Cingular Wireless PCS, Transmission Agency of California, Smg-Redding LLC, Paradise KCVU-TV, and Sinclair California (Appendix D; Comsearch, 2007). As explained under Impact 3.5-3, the Project would not cause transmission interference for any of these paths based on the location information currently known; however, interference is possible if these paths have not been accurately represented in existing databases. Therefore, the Project could cause a significant impact on these transmissions before mitigation. The existing wind turbines at Hatchet Ridge already have been evaluated in the EIR for that project and their role in microwave and cellular transmission interference addressed by implementation of Mitigation Measure USS-1, which required notification and correction of conflicts similar to what is required under Mitigation Measure 3.5-3 for the proposed Project (Shasta County, 2008). Therefore, the existing Hatchet Ridge Wind Project would not cause interference with the same signals during the same timeframe that the Project could cause interference, and the two projects' impacts would not combine to result in a significant cumulative impact.

3.5.5 References

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3.6 Cultural and Tribal Cultural Resources

This section identifies and evaluates issues related to Cultural Resources and to Tribal Cultural Resources in the context of the Project and alternatives. It includes information about the physical and regulatory setting and identifies the criteria used to evaluate the significance of resources and potential impacts, the methods used in evaluating these impacts, and the results of the impact assessment. The information and analysis presented in this section are based in part on the *Fountain Wind Energy Project Cultural Resources Phase 1 Inventory of 4,463 Acres, Shasta County* (Stantec, 2019), the *Addendum 1: Update to The Fountain Wind Energy Project Cultural Resources Phase 1 Inventory of 4,463 Acres, Shasta County, California* (Stantec, 2020a) and *Addendum 2: Updated Cultural Resources Inventory Report: Tribal Coordination and Correspondence* (Stantec, 2020b).

The County independently reviewed these and other materials prepared by or on behalf of the Applicant and determined them to be suitable for reliance on (in combination with other materials included in the formal record) in the preparation of this Draft EIR.[1]

During the pre-scoping process, the Pit River Tribe provided initial input for the County's environmental review process shortly after the CUP application was filed for the Project (McDaniels, 2018). This input confirmed that the Project Site is within the Ancestral territories of the Madesi, Itsatawi, and Atsugewi Bands of the Pit River Tribe. Later, in response to the issuance of notice of intention to prepare this Draft EIR, the County received scoping input about potentially affected historical resources including Moose Camp, official historic sites on the Buffum Homestead that were certified after the 1992 Fountain Fire, and a cabin within the Project Site that was built in the 1800s.The potential to disturb human remains, including Native American burials and burial sites, also was identified. The County also received scoping input specifically regarding Tribal Cultural Resources from the Pit River Tribe and Tribal members, including the Ilwami Band, the Madesi Band, and the Atsuge Band. The County also received scoping input about Tribal Cultural Resources from the Susanville Indian Rancheria, a political entity comprised of Maidu, Paiute, Pit River, and Washoe ethnographic tribes. All scoping input received, including regarding Cultural Resources and Tribal Cultural Resources, is provided in Section 4.1 of the Scoping Report, a copy of which is provided in **Appendix J**, *Scoping Report*.

3.6.1 Setting

3.6.1.1 Study Area

The Project Site (consisting of approximately 4,464 acres of private property) is located approximately 6 miles west of Burney, 35 miles northeast of Redding, immediately north and south of SR 299. The Project Site is located within the southern end of the Cascade Range with

[1] The Report and Addenda are not provided for public review because Shasta County, as the CEQA Lead Agency for this Project, will maintain the confidentiality of sensitive cultural resource inventories or reports generated for this EIR. This decision is consistent with existing law's protecting sensitive cultural information, including, for example, information about the location of an archeological site, sacred lands, graves, cemeteries, and sacred places and records of Native American places, features, and objects (see, e.g., Pub. Res. Code §§5097.9, 5097.993; 14 Cal. Code Regs. §15120(d)).

topography characterized by buttes and peaks separated by small valleys. The Lassen National Forest lies to the southeast, and the Shasta-Trinity National Forest is to the north. Other surrounding lands are privately owned; many are used for timber harvesting purposes.

Elevations within the Project Site range from 3,000 to 6,000 feet above sea level. Little Cow Creek and the south fork of Montgomery Creek cross the Project Site from east to west. Other small tributaries run through the valleys. Existing land uses within the Project Site consist exclusively of managed forest lands. Unpaved logging roads and transmission lines cross the Project Site. The total anticipated construction disturbance is 1,384 acres and the total permanent disturbance is 713 acres. The total disturbance area (1,384 acres) is the *Area of Direct Impact (ADI)* for the analysis of impacts to archaeological resources and human remains; that is, areas that could experience direct ground disturbance from construction, operation and maintenance, and decommissioning of the Project. The Project Site, as well as all areas that could experience indirect impacts such as visual impacts or changes in use, are the *Study Area* for this analysis of impacts to tribal cultural resources.

3.6.1.2 Environmental Setting

This section has been adapted from a Project-specific study (Stantec, 2019) commissioned by the Applicant that has been independently reviewed by the County and found to be suitable for reliance in combination with other sources of data to inform this analysis. All references cited are included in that document.

Natural Setting

The Project is located near the southern end of the Cascade Range between Redding and Burney, California. The area provided, and still provides, a rich resource base that was exploited by prehistoric and historic Native American populations. Beginning in the 1800s, Euroamericans also exploited the area primarily for gold, timber, and ranching. Fauna associated with these habitats includes raccoon, rabbit, mule deer, California ground squirrel, western gray squirrel, coyote, bobcat, black bear, mountain lion, rattlesnakes, gopher snakes, Northwestern pond turtle, turkey vultures, red-railed hawks, great horned owls, killdeers, a variety of sparrow, Steller's jay, western scrub jay, mourning doves, Canadian geese, ducks, other small birds, salmon, and rainbow trout.

The Cascade Range is characterized by a north-south trending chain of large volcanos and is primarily composed of volcanic and sedimentary deposits. Two of the Cascade Range's best-known volcanic peaks, Mount Rainier in Washington and Mount Lassen in California, have both been active in recent or historical time. The Cascade Range also includes areas of flat lava plateaus, lava and cinder cones, plug domes, ash beds, steep ridges, and glacial deposits. The Project Site consists mainly of Tertiary volcanic flow rocks. It is also characterized by several buttes and peaks separated by small valleys formed by a number of tributaries in the Pit River and Cow Creek Watersheds. Other significant waterways in the vicinity of the Project Site include the north and south forks of Montgomery Creek and Little Cow Creek.

Cultural Setting

Prehistoric Overview

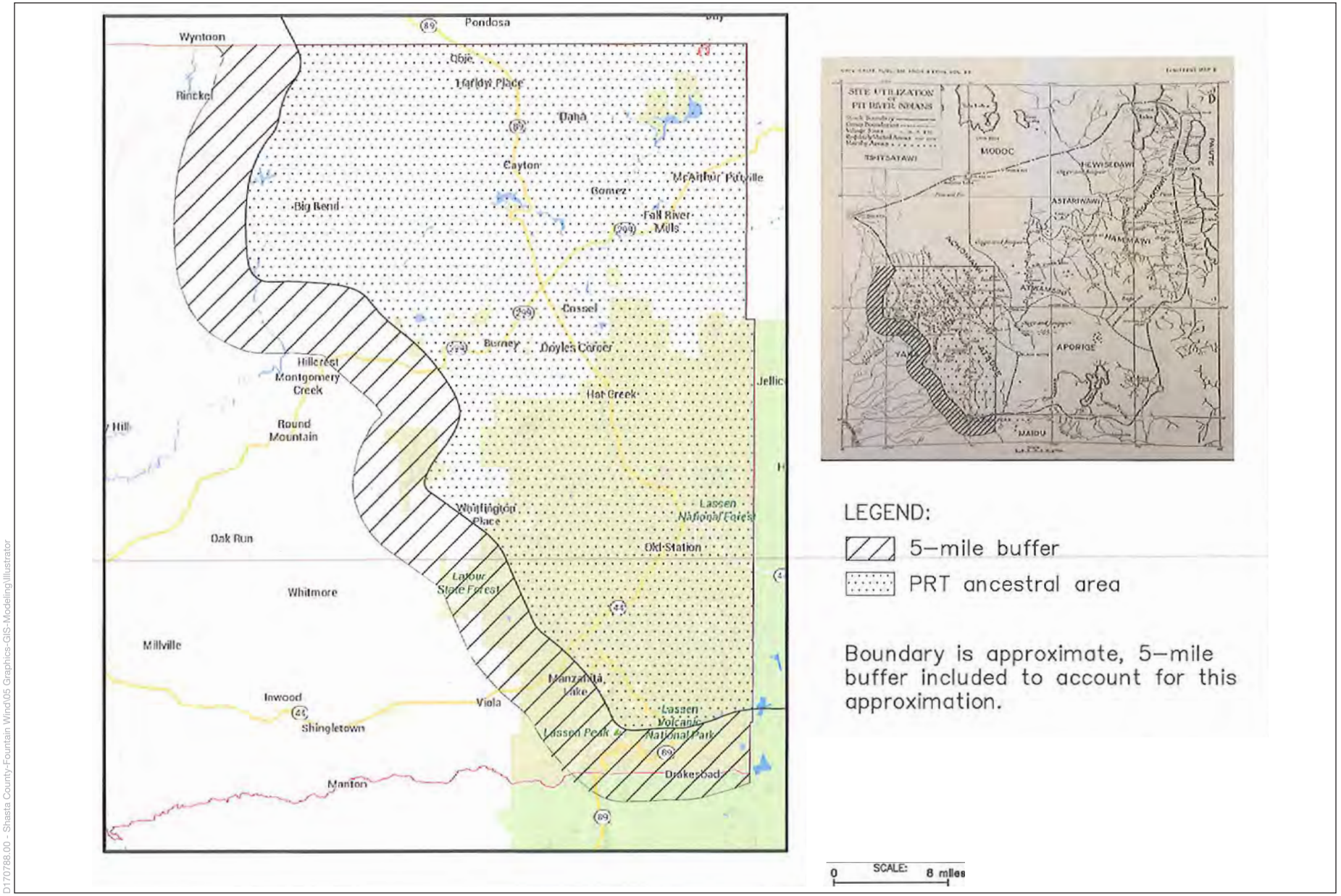
Regional archaeological investigations have developed classification schemes that attempt to place assemblages of cultural material in specific temporal and spatial contexts. Many of these schemes also attempt to associate artifact assemblages with specific groups and/or settlement/subsistence strategies. One of the more comprehensive of these chronologies includes five generalized cultural patterns spanning 8,000 years: the Borax Lake Pattern (6050–3050 B.C.), the Squaw Creek Pattern (3050–1050 B.C.), the Whiskeytown Pattern (1050–950 B.C.), the Tehama Pattern (A.D. 150–1200), and the Augustine Pattern of the Redding Aspect (beginning A.D. 1200). The Borax Lake Pattern included assemblages of wide-stemmed points, handstones, milling slabs, and ovoid flake tools, and is attributed to Hokan speaking peoples entering the area. The Squaw Creek Pattern appears to represent more intensive occupation of the southern Cascade region than the previous period as well as new artifact assemblages, which may reflect the migration of ancestral Yokuts and Miwok into the southern Cascades. The Whiskeytown Pattern appears to represent a shift in settlement and subsistence strategies in the Redding area. The Tehama Pattern appears to be associated with the appearance of the bow and arrow in the region, and is thought to reflect a mobile settlement/subsistence strategy that exploited multiple environments. The Augustine Pattern, Redding Aspect is associated with the prehistoric Wintu, is highlighted by the establishment of permanent villages along the banks of rivers, and a subsistence pattern that is orientated toward riverine resources and acorn processing. Others have proposed revised cultural chronologies; the refinement of these schemes integrate various regional chronologies and research frameworks. In summary, archaeological research in the northern Sacramento Valley and surrounding area has provided cultural chronologies for the area and other information regarding its use and occupation by Native American populations, but questions persist regarding the chronologies, patterns of prehistoric settlement, and subsistence in the region.

Ethnographic Overview

Prior to the arrival of Euroamericans in the region, California was inhabited by groups of Native Americans speaking more than 100 different languages and occupying a variety of ecological settings. The Project location is within or near the ethnographic territory of the Madesi, Itsatawi, and Atsugewi Bands of the Pit River Tribe. Ethnographic and historic records indicate that there were villages associated with these groups in the general vicinity of the Project Site. See **Figure 3.6-1**, *Pit River Tribe Ancestral Boundary*.

Achumawi (meaning River People), also known as the Pit River Indians, have traditionally inhabited areas of Shasta County in northeastern California from southern Goose Lake in the north to Eagle Lake in the south and from the Warner Range in the east to Mount Shasta in the west, including a large segment of the Pit River drainage. Achumawi along with the Atsugewi dialect form the Palaihnihan language family that is part of Hokan stock. Achumawi comprise several bands that function as autonomous political units.

Atsugewi have traditionally inhabited the territory adjacent to the southern boundary of the Achumawi on the north and extending to Mount Lassen on the south. The village is the basic autonomous political unit of the Atsugewi.



SOURCE: Shasta County Department of Public Works

Fountain Wind

Figure 3.6-1
Pit River Tribe Ancestral Boundary

ESA

Yana, also known as the Redding Rancheria, traditionally inhabited the Upper Sacramento River Valley and foothills east of the river. On the east, Yana territory encompasses the upper Deer Creek drainage through the upper Battle, Cow, and Montgomery Creek drainages. Yana speak a Hokan language, and comprise several bands that function as autonomous political units. Much of what is known about Yana culture was provided by Ishi, a Yahi Yana, who was brought to the University of California in 1911 after his family group died and he was left alone to survive.

Technology and subsistence strategies of the Achumawi, Atsugewi, and Yana are relatively similar. However, subsistence strategies (e.g., use of various plants and animals) do vary among the three groups because of access to different plant and animal habitats in their individual territories. Achumawi, Atsugewi, and Yana remain active in their communities and retain strong interests in the management and protection of their heritage and natural resources in the area encompassing the Project Site.

Historic Overview

The expedition of Peter Skene Ogden across the northern Sacramento Valley in 1827–1828 is probably the earliest encounter between Native Americans and Euroamericans in the general area of the Project Site. Succeeding expeditions of Euroamerican explorers and fur trappers brought foreign diseases that took a huge toll on the Native Americans in northern California. In 1846, Mexico granted Pearson B. Reading the 26,000-acre San Buenaventura land grant, also known as Rancho Buenaventura, and Native Americans soon found themselves in competition for resources with settlers who were rapidly moving into the area. In 1848, Reading discovered gold in Clear Creek and his discovery caused an influx of large numbers of gold-seekers to the area. A community named Horsetown located west of present day Redding, quickly grew up around Reading's discovery site, which was also called Reading's Bar or Clear Creek Diggings. The initial dramatic growth of mining and miners in the area was relatively short lived and mining operations declined and eventual stopped. The decline and cessation of mining forced landowners and other residents to turn to other industries to survive. Agriculture, primarily cattle ranching and logging, became the alternatives of choice in the area. Elias Anderson, one of Shasta County's first settlers, purchased the American Ranch in 1856. His original land holdings are approximately the center of present-day Anderson.

The Project vicinity is associated with the development and growth of logging in Shasta County. A sawmill was constructed on the top of Hatchet Mountain in 1872 and an associated flume (known as the Terry Lumber Flume) ran from the sawmill to eventually, the community of Bella Vista through the area of Buzzards Roost. By 1872, the area around Hatchet Mountain was being logged with timber being transported from the area via a 5-mile-long flume. The flume carried rough cut lumber from a mill on Hatchet Mountain to Bella Vista for final processing at Enright's lumber mill. Bella Vista expanded around and along with Enright's logging and milling operations. Flume tender houses were built on stilts level with the flume along the route. These houses were occupied by flume tenders and their families.

In 1897, Joseph Terry took over Enright's holdings, including the flume, and operated the business until 1919 when it and the flume were closed due to financial problems. In 1920, the business was purchased by the Red River Lumber Company, which only remained in business for two years. The

flume, however, continued to and is still known as the Terry Lumber Flume. The only known existing piece of the flume is located at the Shasta College Museum and Research Center in Redding. The Terry Lumber Company also built a railroad system across its holdings. The railroad system connected with a branch of the Central Pacific and subsequently the Southern Pacific Railroad at Bella Vista. The railroad system facilitated the transportation of timber and timber products from sites of more remote logging operations to local mills and eventually to Redding.

The growth and development of the northern Sacramento River Valley and surrounding area between the 1870s and 1880s is highlighted by the founding of the City of Redding in 1872. The city was named in honor of Benjamin B. Redding, a land agent for the Central Pacific Railroad Company. The town was rechristened "Reading" in 1874, to honor the early pioneer Pierson B. Reading, but the railroad would not recognize the name change. Consequently, the original name, Redding, was restored in 1880. Redding was located at the end of the Central/Southern Pacific railroad line until 1883, when the line was extended further north. Redding was incorporated in 1887 as the first municipality in Shasta County and became the county seat in 1888. By 1910, the city had a population of 3,572 that was supported by a significant mineral extraction industry, principally copper and iron. With the decline of these industries, the population dramatically dropped by 1920, but by 1930 the population was recovering and then boomed during the 1930s with the construction of Shasta Dam. The building of the dam, which was completed in the 1940s, caused the population to nearly double by 1940. Logging was an industry in the area since the Gold Rush, but in the late 1940s it expanded in the area and joined agriculture and mining as an important regional industry. From the 1950s to the 1960s, Redding continued to grow with the expansion of the lumber industry, the building of Whiskeytown and Keswick Dams, and the completion of Interstate 5. Logging continues to be an important business in the area today, but tourism also has become a thriving business centered on places such as Shasta Dam and Lake, Whiskeytown Reservoir, Shasta State Historic Park, Lassen Volcanic National Park, and McArthur Burney Falls State Park.

Existing Conditions

To identify the presence or absence of potentially significant cultural resources in the ADI and Study Area that could be considered a historical resource, unique archaeological resource, or tribal cultural resource for the purposes of CEQA, a California Historical Resources Information System (CHRIS) record search, a desktop review of historic-era documents, and a field survey of the proposed ADI were conducted.

Background Research

Personnel conducted a records search at the Northeast Information Center (NEIC) of the CHRIS on September 13, 2017 (NEIC File No. D17-150) to obtain and review previous cultural resource records, cultural resource studies, and any additional documentation pertaining to properties located within a 0.25-mile extent of the ADI. In addition to conducting a record search at the NEIC, historical maps, aerial photographs, and literature were reviewed to determine past land use activities within and surrounding the Study Area that could indicate the likelihood of encountering cultural resources. The results indicate the entire area had been previously studied and 64 previously recorded cultural resources are located within the ADI and within a 0.25 mile of the ADI.

Survey Effort

Between January 17 and September 20, 2018, and October 7 and November 3, 2019, Stantec archaeologists, led by three Secretary of the Interior-qualified archaeologists, conducted six rotations of pedestrian field surveys of the original and revised Project Site. The final Project Site encompassed 4,463 acres of private property. The entire 4,463-acre Project Site was subject to analysis as part of this inventory. The majority (80 percent) of the Project Site was inventoried by archaeologists walking linear transects at an interval not more than 15 meters (m) apart. Areas of extreme slope (defined as greater than 30 percent) or impassable vegetation were considered unsafe to inventory at the set transect interval. These areas (20 percent) were inventoried by walking established safe paths downslope where possible and inspecting adjacent areas visually. If the crew encountered topographical features considered sensitive for cultural resources, such as springs, drainages, or rock outcrops, those features were thoroughly inspected by the individual encountering them when this was safe to do so. No subsurface testing was undertaken in the course of this survey. Areas with limited ground visibility were inspected using a combination of visual inspection of rodent burrows, road cuts, and periodic removal of vegetation cover by the surveyors (done at a frequency of about every 25 meters on a given transect) using shovel and/or boot scrapes. If sites were identified in areas with limited to no surface visibility a visual inspection of boot scrapes, rodent burrows, road cuts, and topography was implemented to determine site boundaries.

The purpose of the Phase I pedestrian surface survey was to inspect the Project Site for cultural resources such as chipped stone (obsidian, chert, and basalt) flakes and tools (e.g., projectile points, knives, scrapers, flake tools), shellfish remains, ground stone, fire-affected rock, and other indicators of prehistoric archaeological resources. The field surveyors also inspected the Project Site for evidence of historic-era archaeological resources, such as surface scatters of logging, and farming or domestic type artifacts (e.g., glass, ceramic, metal), as well as features such as alignments of stone or brick, foundation elements from previous structures, minor earthworks, and historic plantings (e.g., old fruit, nut, or other types of trees and ornamental plants). Certain site types were identified as likely to occur in the Project Site. Because most of the Project Site is located on ridgetops, prehistoric sites are most likely to occur as surface expressions of artifacts associated with subsistence and resource extraction activities. The types of artifacts that might be present include cutting tools and groundstone artifacts associated with seed, nut, and root/tuber collection and processing, as well as projectile points and flake tools associated with capture and butchery of terrestrial fauna. Historic site types could include logging related artifacts and features in forested areas and ranching related features including, barns, houses, roads, corrals, fences, water conveyance features, improved spring areas, livestock loading and unloading (chutes and corrals), and feeding and salt lick sites.

Twelve newly discovered cultural resource sites were recorded on Department of Parks and Recreation (DPR) 523 forms using iPads and paper field notepads. Site recordation included photographic documentation and Global Positioning System (GPS) data, including site area boundary polygons, sketch maps, and location maps. Site boundaries were recorded up to 30 meters beyond the Project Site boundary. Twelve newly-discovered cultural resource sites were distinguished from isolated finds based on density of artifacts per unit area. Artifact concentrations greater than three artifacts within a 10-square-meter area were recorded as sites. All new identified artifacts received an artifact photograph and GPS location, with a distance and

bearing to the site datum. Previously recorded cultural resources were revisited and a continuation sheet documenting any changes was completed. The cabin noted during scoping was not identified during the survey effort. Isolated finds were recorded using a DPR 523 series Primary Record form, including a photograph and a GPS location.

Inventory Results and Evaluations

Stantec archaeologists revisited and updated 8 previously recorded cultural resource sites and recorded 12 newly discovered cultural resource sites in the ADI. Additionally, the crew identified and recorded 24 isolates in the ADI.

FOU0919-1-1

This site consists of two features located approximately 5 meters north of a wetland area. Feature one is a possible collapsed structure and includes a board scatter and tin siding. Feature two is a wooden plank dam and reservoir. Several faunal bones were found in the vicinity. The survey crew was unable to fully record this site due to safety concerns from the deteriorated condition of the resource. This resource is an unassociated habitation debris with undiagnostic artifacts. This site is likely associated with historic logging or hunting located throughout the area.

FOU0919-2-14

This site consists of an irregular mound, approximately 3 feet high with a circumference of 90 feet and is most likely a yarder mound.[2] The site is located adjacent to a dirt access road in a wooded area. The area is heavily disturbed by modern logging activity. The mound has been heavily disturbed.

FOU0920-2-1

This resource consists of a small can scatter located south of an access road under a transmission line. Artifacts observed include three tin cans, two of which have puncture holes and one is a hinge top. Miscellaneous metal parts also were observed. The site measures 50 feet north/south by 10 feet east/west. The area has been heavily disturbed by the access road.

FOU0922-1-1

This site consists of a small concentration of historic debris located on the north side of Goat Creek Road. The artifacts have been dispersed throughout the area by the construction of a road cut. Artifacts include logging cable, a metal car part, concrete base with iron pipe attached, a metal can, and a crushed metal bucket. The site measures 10 feet by 10 feet.

FOU0923-1-2

This site consists of a small historic trash scatter located on the western side of Supan Road. Artifacts observed include eight fuel cans, one small oil reservoir, one crushed metal bucket, two metal oil cans, and one small metal gas can. The site measures 100 feet north/south by 10 feet east/west. A metal car part is located in the northern portion of the site with no other diagnostic elements.

[2] A yarder is a machine or system of winches used to haul logs onto a landing.

FOU1015

This resource consists of historic debris and features measuring 85 feet north/south by 100 feet east/west located directly south of 270P Access Road. Feature 1 is a yarder mound measuring 94 feet east/west by 45 feet north/south. Feature 2 is a rail segment measuring 13 feet long. Feature 3 is a linear ditch running northeast/southwest and measuring 14 feet long. Associated artifacts include a logging cable.

FW 03

This is a small historic refuse scatter in a cleared-out forest plantation. The inventory includes one "Bayer Aspirin" tin, one vegetable can, four sanitary cans, one "Kerr Mason" jar lid, various assorted brown and clear glass fragments, two modern bottle caps, and one clear glass jar with screw top and a maker's mark "40 57."

FW 06

This site consists of historic debris located within a transmission line corridor. Artifacts include a barrel hoop, tobacco can, and a railroad spike. One obsidian flake also was observed; it was recorded as an isolated find.

FW 09

This site consists of a small historic refuse scatter located within a transmission line corridor. Artifacts include steel cable and two sanitary cans.

FW 11

This multicomponent site consists of a lithic scatter and other prehistoric loci, and historic logging artifacts. The prehistoric (within the primary lithic scatter) cultural resources include four primary, seven secondary, and 12 tertiary grey-black fine grain basalt flakes, as well as two primary, one secondary, and eight tertiary black obsidian flakes. There is also one basalt core fragment and two flake tools consisting of a secondary basal flake tool with a serrated margin and a black obsidian overshot flake tool with two working margins. One working margin is along an edge of the flake extending from the striking platform and the other working margin is along the distal end of the tool where the flake was cleaved off the edge of a previously form flaked tool.

Outside of the primary scatter, three additional resources were observed that are most likely associated with this site. The first prehistoric locus of artifacts is located approximate 77 meters northwest of the primary lithic scatter and consists of a handstone located on a small terrace east of a drainage that runs downhill into the riparian area in which the primary site is located. Fragments of basalt from the same material in the primary site (possibly flaked) also were found in the drainage.

The second locus of prehistoric artifacts is located across the riparian area 52 meters south of the datum along the edge of a mixed conifer forest and on the north side of an unimproved access road. Though this is outside the primary lithic scatter, low visibility in the marshy meadow between these two resource locations may have additional cultural materials that link the two sites. Resources in this area include one black obsidian biface fragment, proximal end; four tertiary black obsidian

flakes; and one secondary and two tertiary fine grain basalt flakes. Additional historic resources in this area include one segment of logging cable, one colorless clear glass bottle body fragment, one slightly crushed 55-gallon fuel drum, and one choker cable fragment.

The third locus consists of one tertiary grey-black fine grain basalt flake and one tertiary black obsidian flake located 34 meters southeast of the primary lithic scatter in the south side of the riparian area. These flakes are also 51 meters east of the resources in locus 2.

Additionally, historic artifacts in this area include the remains of a rusted chain saw chain, and a non-diagnostic fragment of iron metal sheeting.

FW 12

This is a historic refuse scatter consisting of multiple fragments of white earthenware. Some fragments are crazed, or covered in a web of cracks. Fragments appear to be part of a larger serving plate, possibly all from the same plate. One fragment has a partial makers mark that cannot be identified. Ferrous metal fragments from cans and other domestics are also present. Most are crushed and twisted beyond recognition but appear to be from sanitary cans. Two hole-in-cap lids found (base missing).

FW 13

This site consists of a diffuse historic refuse scatter on a slightly southwest sloping terrace in a mixed conifer woodland. Artifacts include fragments of ferrous metal from crush sanitary cans. Three large hole-in-cap can tops were visible (although the bodies were crushed). One small hole-in-cap sanitary can, also crushed, was observed. Additional artifacts include three fragments of whiteware with medium grain white paste and clear glaze (two vessels), as well as one fragment of a steel knife (partial blade and handle only). Ground visibility at the site is 25–75 percent. The site is 60 feet north/south by 43 feet east/west.

P-45-001986

This site was originally recorded in 1992 consisting of a historic railroad logging camp along a railroad grade. The linear feature is part of the larger P-45-002025 resource (described below). Three features associated with structures were identified and recorded. Associated artifacts include glass, ceramic, and metal. Some artifacts were collected at the time of the recording. On September 20, 2018, Stantec relocated the site. Feature 2, a 15-foot by 20-foot rectangular pit with an earthen berm, was identified. Features 1 and 3 were not relocated. Artifacts associated with the camp were relocated, including barrel hoops, braded cable, nails, cast iron stone part, can fragments, and brown glass fragments.

P-45-001988

This site was recorded in 1993 as a historic-era railroad logging camp. One concrete pad and hearth, two earthen mounds, and a concentration of artifacts scattered over the northeast portion of the site consisting of more than 200 cans. Some artifacts were collected at the time of the 1993 recording. On October 12, 2018, Stantec archaeologists relocated the site. Two possible privy pits and linear ditch depressions were observed. Artifacts included a can scatter, milk glass jar, metal stove parts, logging cables, brown glass fragments, and metal strips. The site extends into P-45-0001989.

P-45-001989

This site was originally recorded in 1993 and consists of a 90-meter north/south by 65-meter east/west historic-era resource. The site consists of the remnants of logging operations and associated artifacts. Some artifacts appear to have been collected at the time of the 1993 recording. Historic debris is present in between the original site boundaries for P-45- 001988 and P-45-001988. These resources are likely one larger site.

P-45-002014

This resource was originally recorded in 1992 as a logging camp with log chutes, loading decks, numerous structures and associated artifacts. The 2018 Stantec visit relocated datum B, a large stump with cable wrapped around it; Feature F12, a large structure flat that does not match its original configuration because its edges eroded away distorting its shape and creating a gradual slope along its edges; a large, diverse artifact scatter; railroad grade segments; twisted cable; butchered bone; condensed milk cans; steel pipe; sheet metal; barrel hoop straps; white improved earthenware; and a heating apparatus. Other features previously recorded, including structures and chutes could not be relocated. The resource has been heavily disturbed and impacted by recent logging, fire, road maintenance, and erosion.

P-45-002025

This resource is the historic-era remains of the Terry Mill Railroad Logging System consisting of through cuts and fills located in various locations. On September 19, 2018, Stantec field crew visited a previously recorded segment of P-45-002025. From the intersection of P Line and T Line road, traveling approximately 2,400 feet west along P Line road, P-45-002025 railroad grade has been destroyed by modern logging activity within the last 5 years. A berm segment follows the railroad grade and has been heavily disturbed by modern logging, including a recently abandoned logging road. The berm is composed of soil and is partially covered in vegetation. Two metal fragments are associated with the berm. To the south, there is a seasonal stream that seems to be a result of a modern erosion control ditch at the east end of the berm. Other sections of the railroad grade were unobserved and likely completely obliterated.

P-45-002939

This resource consists of the 230-kV Transmission line, including towers and lines. This segment runs from the town of Burney to the Cottonwood Substation in Cottonwood, California. Stantec's field crew revisited this resource during survey efforts. This resource remains unchanged since its original recording in 1999.

P-45-003068

On January 19, 2018, Stantec field crews visited P-45-003068. This resource originally was recorded as a yarder mound measuring 1.5 meters tall, 6 meters wide, and 40 meters long. Road 200T bisects the mound. The resource was relocated and is relatively unchanged.

P-45-003069

On September 23, 2018, Stantec field crews attempted to visit P-45-003069. This resource was originally recorded as a water conveyance system. Specifically, a ditch measuring approximately 0.33 meters deep and 0.66 meters wide. The crew failed to relocate this resource.

Newly Recorded Isolates

A total of 24 isolates were identified. Isolated finds can be prehistoric or historic and consist of one to three artifacts. Less than three artifacts in an area 30 meters or less in diameter with a distance of 30 meters from any other site or artifact constitutes an isolate. Isolates are not considered a prehistoric or historic site because of their inability to provide useful data beyond their identification and documentation. Isolates do not qualify for listing in the California Register of Historical Resources (California Register) according to Public Resources Code Section 21083.2(h); therefore, they are not considered historical resources for the purposes of CEQA. These resources may be considered tribal cultural resources and a component of a tribal cultural landscape as described in the tribal cultural resources section below.

Evaluation of Cultural Resources

Based on the recordation and archival research of the cultural resources identified in the ADI, all of the resources (except the prehistoric component of FW 11, see below) are recommended not eligible for listing in the California Register. Historical information was used to evaluate the resources under California Register Criteria 1, 2 and 3 (described in Section 3.6.1.3, *Regulatory Setting*). The resources included typical features of historic and modern logging operations, refuse deposits, transmission lines, and railroad features, and do not contribute to broad patterns of history in Shasta County, California, or the United States. In addition, the resources generally cannot be associated with a specific person or company, do not have a direct association with a household or workspace, and cannot be associated with a specific group of people. As a result, the resources are recommended as not eligible for listing in the California Register under Criteria 1 or 2. The resources do not represent the distinctive characteristics of a type, time period, or methods of construction; nor do they possess high artistic value or represent significant and distinguishable entities whose components lack individual distinction. The resources are recommended as not eligible for listing in the California Register under Criterion 3. There is no evidence to suggest that the resources would yield information important to history and prehistory, and recording of the resources and archival research has essentially exhausted the data potential for the resources to address research questions. The resources are recommended as not eligible for listing in the California Register under Criterion 4.

Table 3.6-1, *Cultural Resources in the ADI*, provides a summary of the cultural resources and evaluations in the ADI.

Evaluation of Prehistoric Component of FW 11

Stantec conducted an evaluation of FW 11 through a review of ethnographic and ethnohistorical data and through analysis of field investigation. The ethnographic and ethnohistorical data was used to examine the eligibility of the site under California Register Criteria 1, 2 and 3. The field investigation was used to gather data to assess the potential of the site to include buried cultural deposits and its ability to yield data important in prehistory. This prehistoric site consists of a possible flaked stone tool manufacturing site and contains identified flaked stone tools.

TABLE 3.6-1
CULTURAL RESOURCES IN THE AREA OF DIRECT IMPACT

Primary #	Trinomial or Other Identifier	Type	Eligibility[1]	In ADI
P-45-001986	CA-SHA-1986-H	Historic railroad logging camp and railroad grade	Not eligible	Yes
P-45-001988	CA-SHA-1988-H	Railroad logging camp and railroad grade	Not eligible	Yes
P-45-001989	CA-SHA-1989	Historic debris	Not eligible	Yes
P-45-002014	CA-SHA-2014-H	Historic logging camp	Not eligible	Yes
P-45-002025	CA-SHA-2025-H	Historic Terry Mill railroad grade	Not eligible	Yes
P-45-002939	---	Transmission line	Not eligible	Yes
P-45-003068	---	Historic yarder mound	Not eligible	Yes
P-45-003069	---	Water conveyance system	Not eligible	Yes
---	FOU0919-1-1	Historic debris	Not eligible	Yes
---	FOU919-2-14	Yarder mound	Not eligible	Yes
---	FOU0920-2-1	Can scatter	Not eligible	Yes
---	FOU0922-1-1	Historic debris	Not eligible	Yes
---	FOU0923-1-2	Historic debris scatter	Not eligible	Yes
---	FOU1015	Historic logging equipment	Not eligible	Yes
---	FW 3	Historic debris	Not eligible	Yes
---	FW 6	Historic debris and isolated lithic	Not eligible	Yes
---	FW 9	Historic debris	Not eligible	Yes
---	FW 11	Multicomponent lithic scatter / historic debris	Prehistoric component eligible. historic component, not eligible	Yes
---	FW 12	Historic debris	Not eligible	Yes
---	FW 13	Historic debris	Not eligible	Yes

NOTE:
[1] Stantec 2019

Research into the ethnographic use of this area did not result in any information that tied this site to any particular event in the past and there was no indication of the site being associated with any person or group important in the past. Thus, the site is recommended as not eligible for listing in the California Register under Criteria 1 and 2. It does not embody the distinctive characteristic of a type, period or method of construction and does not represent the work of a master (e.g., the artifacts are not temporally sensitive); nor does it possess high artistic value or represent a significant and distinguishable entity whose components lack individual distinction. The site is recommended as not eligible for listing in the California Register under Criterion 3.

To examine the site's California Register eligibility under Criterion 4, the first step is to determine if there are cultural deposits that have depositional integrity. This is the basis for looking at the ability of the data contained within a site to address research questions about the past. Though no archaeological excavation was conducted at this site, the presence of a variety of lithics and tools

indicate that there is a possibility to yield additional information in prehistory beyond the existing documentation of the site. Based on these observations, the site is recommended eligible for listing in the California Register under Criterion 4.

Based on the evaluation presented above, the prehistoric component of FW 11 qualifies for listing in the California Register and is therefore considered a historical resource for the purposes of CEQA. See discussion b) in Section 3.6.3.2 for consideration of impacts and proposed mitigation measures for this historical resource.

Tribal Cultural Resources

Stantec requested a Sacred Lands Search (SLS) for the project from the Native American Heritage Commission (NAHC) on September 17, 2017. The purpose of the search was to ascertain whether there are resources or locations that may be of importance to Native Americans who have traditionally resided in the area encompassing the Project Site. The SLS search was conducted as part as the cultural technical report and is not considered to be consultation pursuant to Assembly Bill 52. On September 19, 2017, NAHC responded, stating that a review of their files yielded positive results for sacred lands located within the Project vicinity. NAHC also provided the contact information for several local tribes who may have additional information. Stantec contacted these tribes by letter on November 29, 2018.

Shasta County sent notification letters to tribes on December 8, 2017; however, no tribe requested Assembly Bill 52 consultation within the 30-day time limit. The Initial Study was published on April 6, 2018, with a paragraph noting that Assembly Bill 52 consultation had not been timely requested.

A response letter from the Greenville Rancheria was received by Stantec on December 31, 2018; the tribe has no comments or objections to the Project. On January 4, 2019, a response letter from the Pit River Tribe was received requesting formal consultation. This letter was included in the final technical report submitted to the County. In 2019, the Applicant reduced the Project size from 100 turbines to 72 turbines. Following this reduction in size, Stantec resubmitted a SLS request to the NAHC on October 29, 2019. NAHC's responded on November 13, 2019, stating that a review of their files yielded positive results. NAHC also provided contact information for several local tribes who may have additional information. On November 15 and November 20, 2019, Stantec sent letters by Certified Mail to the contact list provided by NAHC as well as the contact list provided to the Applicant by the California Department of Forestry and Fire Protection (CAL FIRE). Certified Mail receipts were returned for all mailings. Stantec conducted follow-up telephone calls to all of the listed contacts on December 4, 2019. These tribes included: The Pit River Tribe, Wintun Educational and Cultural Council, Nor-Rel-Muk Wintun Nation, Redding Rancheria, Shasta Nation, Winnemem Wintu Tribe, and Wintu Tribe of Northern California. The Pit River Tribe responded to the follow up phone call on December 4, 2019, stating that they would like to continue to discuss the Project and would like to schedule an in-person meeting. The Nor-Rel-Muk Wintun Nation representative responded to the follow-up phone call and stated that the Project was outside of the organization's traditional territory. The Nor-Rel-Muk Wintun Nation indicated interest in what, if any, artifacts are found, but deferred coordination to the Pit River Tribe. No other tribes responded to the Applicant's outreach efforts.

Coordination with the Pit River Tribe during the Hatchet Ridge Project identified Hatchet Ridge–Bunchgrass Mountain, which is located outside the leasehold area, as a culturally significant site, particularly to the Itsatawi and Madesi bands, and possibly the Atsuge, whose traditional territories are separated by Hatchet Ridge (Tiley, 2007; Appendix C in Shasta County, 2007). Hatchet Ridge–Bunchgrass Mountain figures importantly in the lives of the Pit River Tribe. For example:

- Hatchet Ridge (located outside of the Project Site) served as a major transportation corridor for the Pit River Tribe.
- Bunchgrass Mountain (located outside of the Project Site) is used as basketry collection locality.
- Wildlife that are traditionally important to the Pit River Tribe cross Hatchet Ridge (located outside of the Project Site) or use it as a migration corridor.
- Hatchet Ridge and Bunchgrass Mountain (both located outside of the Project Site) contain power places. Power places are important locations to the Pit River Tribe because it is at power places where people can obtain power for healing, doctoring, and other purposes.
- The Pit River Tribe used the Hatchet Ridge–Bunchgrass Mountain route to travel between portions of the Pit River drainage and Goose Valley. A feature labeled "Indian Trail" is mapped on a historic survey plat as extending from the eastern edge of Hatchet Ridge into Goose Valley (General Land Office, 1879). Because it was a major foot route out of the Pit River Canyon, people were sometimes carried along this way for burial, and may have been buried trailside in the case of inclement weather. This ridge was also traveled to reach a small lake just to the east, where traditional doctors made vision quests. Hatchet Ridge is presently used by Pit River Tribe members to travel to Bunchgrass Mountain to gather basketry materials (e.g., redbud, bear grass, willow) and huckleberries. It is possible that a portion of this trail is located within the Project Site.

Additional coordination with the Pit River Tribe identified several potential tribal cultural resources that may be located within or near the Project Site (Stantec, 2020b). These include:

- Unspecified locations of ethnographic trails and quarries;
- Unspecified locations of ancestral burial grounds;
- Unspecified areas where medicinal herbs were gathered;
- Views of Yet-Tey-Cha-Na (Lassen Peak) and Kohm Yamani (Snow Mountain) from ancestral lands through the Project Site; and
- Wildlife that are traditionally important to the Pit River Tribe may occur throughout the Project site;

In addition, the prehistoric component of FW 11 has been recommended eligible as a tribal cultural resource (see description and evaluation above).

Input from Tribes during the scoping process and during meetings between the Tribes and the Applicant note that natural and cultural resources are indistinguishable from the Pit River Peoples and are a central element of the spirituality, traditional ceremonial practices, religious

expressions, history, and identity of the Tribe and Tribal members. Tribal members explain that the Tribe and its nation have deep ties to the area, which they describe as a place of refuge, ceremony, healing, prayer, fasting, hunting, gathering, and other sacred traditional uses. Tribal members indicate that burial grounds are believed to present in the Project Site. Tribal members expressed concern that the construction, operation, and maintenance of the Project could infringe on the freedom of religion and the cultural practices of the Pit River Tribe and other Indian Tribal Nations in the region and that the Project could adversely affect sacred sites, traditional plants, and the viewshed of mountains held sacred by the Tribe including Yet-Tey-Cha-Na (Lassen Peak) and Kohm Yamani (Snow Mountain). An old ridgetop trail that connects the Pit River to Goose Valley to the Lassen area and has traditionally been, and continues to be, used to reach remote areas during vision quests may be located within the Project Site. The ridge also is identified as a boundary between the Itsatawi, Madesi, and Atsugewi Bands. Birds traditionally important to the Pit River culture (such as eagles and eagle nests, osprey, ducks, and geese) cross the ridge and could be injured or killed by the turbine blades. Deer also migrate across the ridge. Commenters suggest that sounds generated by the Project could disrupt bird and animal patterns, as well as human experiences in the area. Existing conditions identified in comments as contributing to ongoing impacts to tribal cultural resources include burdens from power generating activities associated with the Hatchet Ridge Wind Project, power lines, dams, and PG&E hydroelectric activities (Appendix J).

These resources collectively contribute to a potential tribal cultural landscape. In addition, the resources described above are potential tribal cultural resources for the purposes of the CEQA analysis.

3.6.1.3 Regulatory Setting

Federal

Although federal laws address cultural and tribal cultural considerations (including, but not limited to, the National Historic Preservation Act, Archaeological Resources Protect Act, and Native American Historic Resource Protection Act), there is no federal nexus to this Project. Accordingly, there are no federal regulations that apply to the Project with respect to Cultural or Tribal Cultural Resources.

State

California Register of Historical Resources

The California Register is “an authoritative listing and guide to be used by state and local agencies, private groups, and citizens in identifying the existing historical resources of the state and to indicate which resources deserve to be protected, to the extent prudent and feasible, from substantial adverse change” (Pub. Res. Code §5024.1[a]). Certain resources are determined by the statute to be automatically included in the California Register, including California properties formally determined eligible for, or listed in, the National Register of Historic Places (National Register).

To be eligible for the California Register, a historical resource must be significant at the federal, state, or local level under one or more of the following criteria (Pub. Res. Code §5024.1[c]):

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage.
2. Is associated with the lives of persons important in our past.
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values.
4. Has yielded, or may be likely to yield, information important in prehistory or history.

"Integrity" is the authenticity of a historic resource's physical identity as shown by the survival of characteristics that existed during the period of significance. For a resource to be eligible for the California Register, it also must retain enough integrity to be recognizable as a historic resource and to convey the reasons for its significance. Integrity is evaluated with regard to the retention of location, design, setting, materials, workmanship, feeling, and association. A resource that does not retain sufficient integrity to meet the National Register criteria may still be eligible for listing in the California Register.

California Public Resources Code and Tribal Cultural Resources

In 2014, the California Legislature enacted Assembly Bill (AB) 52, which added provisions to the Public Resources Code regarding the evaluation of impacts on tribal cultural resources under CEQA, and requirements to consult with California Native American tribes as defined in Government Code Section 65352.4. In particular, AB 52 requires lead agencies to analyze project impacts on "tribal cultural resources" separately from archaeological resources (Pub. Res. Code §§21074 and 21083.09). AB 52 defines "tribal cultural resources" in Public Resources Code Section 21074 and requires lead agencies to engage in additional consultation procedures with respect to California Native American tribes (Pub. Res. Code §§21080.3.1, 21080.3.2, and 21082.3).

A "tribal cultural resource" is defined in Public Resources Code Section 21074 as either a site, feature, place, or cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

1. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k); or
2. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in Public Resources Code Section 5024.1(c). In applying the criteria set forth in Section 5024.1(c), the lead agency shall consider the significance of the resource to a California Native American tribe.

California Public Resources Code Sections 5097.98 and 5097.99

Public Resources Code Section 5097.98 (reiterated in CEQA Guidelines §15064.5[e]) identifies steps to follow in the event of the accidental discovery or recognition of any human remains in

any location other than a dedicated cemetery, including notification of the most likely descendent. Section 5097.99 prohibits obtaining or possessing any Native American artifacts or human remains that are taken from a Native American grave or cairn (stone burial mound).

California Health and Safety Code Section 7050.5

Health and Safety Code Section 7050.5 protects human remains by prohibiting the disinterment, disturbance, or removal of human remains from any location other than a dedicated cemetery.

Forest Practice Act of 1973

The Z'Berg-Nejedly Forest Practice Act of 1973 (Pub. Res. Code §§4511–4360.2) and its implementing regulations, the Forest Practice Rules (14 Cal. Code Regs. §895 et seq.), govern the management of privately owned forestlands in California, including with respect to the protection of archaeological and historical resources. See, for example:

- Rule 949 Statement of Purpose (14 Cal. Code Regs. §949)
- Rule 949.2 Protection Measures for Plans and Emergency Notices 3 Acres and Larger (14 Cal. Code Regs. §949.2)
- Rule 949.3 Post Review Site Discovery (14 Cal. Code Regs. §949.3)
- Rule 949.4 Archaeological Training Requirements (14 Cal. Code Regs. §949.4)
- Rule 949.5 Site Recording (14 Cal. Code Regs. §949.5)
- Rule 949.6 Protection of Sites During Timber Operations (14 Cal. Code Regs. §949.6)
- Rule 949.7 Determination of Significance (14 Cal. Code Regs. §949.7)

Local

The Shasta County General Plan includes the Heritage Resources Element as authorized by Section 65303 of the Government Code. This Element is intended to identify and protect sites and structures of architectural, historical, archaeological, or cultural significance.

6.10.3 Objective HER-1: Protection of significant prehistoric and historic cultural resources.

> ***6.10.4 Policy HER-a*:** Development projects in areas of known heritage value shall be designed to minimize degradation of these resources. Where conflicts are unavoidable, mitigation measures which reduce such impacts shall be implemented. Possible mitigation measures may include clustering, buffer or nondisturbance zones, and building siting requirements.

3.6.2 Significance Criteria

CEQA Guidelines Appendix G Section V identifies considerations relating to cultural resources. See Section 3.1.4, *Environmental Considerations Unaffected by the Project or Not Present in the Project Area*, as it relates to the County's analysis of the potential impacts of this Project to cultural resources considerations suggested in CEQA Guidelines Appendix G. Otherwise, for

purposes of this analysis, a project would result in a significant impact to Cultural Resources or Tribal Cultural Resources if it would:

a) Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5;

b) Disturb any human remains, including those interred outside of formal cemeteries; or

c) Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:

   i) Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code Section 5020.1(k), or

   ii) A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in Public Resources Code Section 5024.1(c). In applying the criteria set forth in Public Resources Code Section 5024.1(c), Shasta County, as the CEQA lead agency, has considered the significance of the resource to a California Native American tribe.

3.6.3 Direct and Indirect Effects

3.6.3.1 Methodology

Historic Architectural Resources

Potential impacts on historic architectural resources are assessed by identifying any activities (during either construction or operations) that could affect resources that have been identified as historical resources for the purposes of CEQA. Once a resource has been identified as a CEQA historical resource, it must be determined whether the project's impacts would "cause a substantial adverse change in the significance" of the resource (14 Cal. Code Regs. §15064.5[b]). A substantial adverse change in the significance of a historical resource means "physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of the historical resource would be materially impaired" (14 Cal. Code Regs. §15064[b][1]). A historical resource is considered materially impaired through the demolition or alteration of the resource's physical characteristics that convey its historical significance and that justify its inclusion in the California Register (14 Cal. Code Regs. §15064.5[b][2][A]).

Where potential impacts on historical resources are identified, CEQA Guidelines §15126.4(b) states that compliance with the *Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings* will generally reduce potential impacts to a less-than-significant level. In addition, "in some circumstances, documentation of an historical resource … as mitigation for the effects of demolition of the resource will not mitigate the effects to a point where clearly no significant effect on the environment would occur" (14 Cal. Code Regs. §15126.4[b][2]).

There are no impacts to historic architectural resources from the proposed Project.

Archaeological Resources

Archaeological resources can include historical resources according to CEQA Guidelines Section 15064.5, as well as unique archaeological resources as defined in CEQA Guidelines Section 21083.2(g). The significance of most prehistoric and historic archaeological sites is usually assessed under California Register Criterion 4. This criterion stresses the importance of the information potential contained within the site, rather than its significance as a surviving example of a type or its association with an important person or event. Although less common, archaeological resources may also be assessed under California Register Criteria 1, 2, and/or 3.

Impacts on unique archaeological resources or archaeological resources that qualify as historical resources are assessed pursuant to CEQA Guidelines Section 21083.2, which states that the lead agency shall determine whether the project may have a significant effect on archaeological resources. As with architectural resources above, whether the impacts of the project would "cause a substantial adverse change in the significance" of the resource must be determined (14 Cal. Code Regs. §15064.5[b]).

Treatment for archaeological resources could consist of excavation (or data recovery) of a resource, which is restricted to those parts of the resource that would be damaged or destroyed by a project. Excavation is not required for an archaeological resource if the lead agency determines that already completed testing or studies have adequately recovered the scientifically consequential information from and about the resource.

Human Remains

Human remains, including those buried outside of formal cemeteries, are protected under several state laws, including Public Resources Code Section 5097.98 and Health and Safety Code Section 7050.5. Specifically, CEQA Guidelines Section 15064.5(d) requires a lead agency to work with Native Americans to develop an agreement for treating, with appropriate dignity, human remains and any items associated with the burials. Upon discovery of human remains that the County Coroner determines to be Native American in origin, the Native American Heritage Commission identifies the person or persons it believes to be the most likely descendant from the deceased Native American. This analysis considers impacts on human remains including intentional disturbance, mutilation, or removal of interred human remains.

Tribal Cultural Resources

As defined in Public Resources Code Section 21074, a "tribal cultural resource" is a site feature, place, cultural landscape, sacred place, or object that is of cultural value to a tribe that is either on or eligible for the California Register or a local historic register, or that the lead agency, at its discretion, chooses to treat as a tribal cultural resource. Impacts on tribal cultural resources are assessed in consultation with affiliated Native American tribes in accordance with Public Resources Code Section 21080.3. This analysis considers whether the Project would cause a substantial adverse change in the significance of any tribal cultural resources.

Mitigation for impacts to tribal cultural resources is considered in consultation with the culturally affiliated tribe (or tribes) determined and agreed upon during consultation according to Public Resources Code Section 21083.2(b), and can consist of, but is not limited to:

1) Avoidance and preservation of the resources in place, including, but not limited to, planning and construction to avoid the resources and protect the cultural and natural context, or planning greenspace, parks, or other open space, to incorporate the resources with culturally appropriate protection and management criteria.

2) Treating the resource with culturally appropriate dignity taking into account the tribal cultural values and meaning of the resource, including, but not limited to, the following:

   (A) Protecting the cultural character and integrity of the resource.

   (B) Protecting the traditional use of the resource.

   (C) Protecting the confidentiality of the resource.

3) Permanent conservation easements or other interests in real property, with culturally appropriate management criteria for the purposes of preserving or utilizing the resources or places.

4) Protecting the resource.

3.6.3.2 Direct and Indirect Effects of the Project

a) Whether the Project would cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines §15064.5.

Impact 3.6-1: The Project could cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5. (*Less than Significant with Mitigation Incorporated*)

This section discusses archaeological resources, both as historical resources according to Public Resources Code Section 15064.5, as well as unique archaeological resources as defined in Public Resources Code Section 21083.2(g).

Based on the results of the cultural resources analysis completed for the proposed Project (Stantec, 2019), 8 previously recorded cultural resources and 12 newly discovered cultural resources were recorded in the ADI and evaluated for significance as historical resources eligible for listing in the California Register. Based on those evaluations, one cultural resource (the prehistoric component of FW 11) qualifies for listing in the California Register under Criterion 4, for its ability to yield additional information in prehistory. The prehistoric component of FW 11 is therefore considered a historical resource for the purposes of CEQA. Project-related disturbance of a historical resource would be a significant impact and could occur, for example, during grading and excavation associated with construction of turbine foundations, pads, or domestic water wells; trenching for the underground electrical collector lines or other below-ground facilities and infrastructure; or the soil borings that would be collected to an approximately 50-foot depth to ensure that the proposed turbine foundations would be stable.

The potential for such impact would be reduced to a less-than-significant level through implementation of Mitigation Measure 3.6-1 (Archaeological Research Design and Treatment Plan). This measure sets forth protocols and procedures for implementing a data recovery program to the provide for the establishment of Environmentally Sensitive Areas; treatment and recovery of important data contained within the portions of the historical resource located within and adjacent to the ADI; construction worker cultural resources sensitivity training; archaeological and Native American monitoring; inadvertent discovery protocols; and provisions for curation or reburial of recovered materials.

Mitigation Measure 3.6-1: Archaeological Research Design and Treatment Plan.

Prior to receiving a County grading permit for the Project, the applicant shall:

1. Relocate Project components to a location that would not potentially impact the known historical resource.

2. If relocation is documented to the satisfaction of the County as infeasible (where "feasible" means "capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors" as defined in CEQA Guidelines Section 15364) and the historical resource would potentially be impacted by the Project, design and implement an Archaeological Research Design and Treatment Plan (ARDTP).

The investigation would be completed under the methods and research design outlined in an ARDTP to be prepared in accordance with the California Resources Agency's Guidelines for Archeological Research Designs (California Resources Agency, 1991). A qualified archaeologist (defined as one meeting the Secretary of the Interior's Professional Qualification Standards for archaeology) shall prepare the ARDTP in consultation with the culturally affiliated Native American tribe(s). The ARDTP shall address, at a minimum, the following: the establishment of Environmentally Sensitive Areas; treatment and recovery of important data contained within the portions of the historical resource located within and adjacent to the Project Site; construction worker cultural resources sensitivity training; compensated archaeological and Native American monitoring; inadvertent discovery protocols; and provisions for curation or reburial of recovered materials.

The ARDTP shall include the specific methods that will be employed (e.g., the length and depth of excavation, the type of equipment utilized, the percent of area investigated). The ARDTP shall identify how the proposed investigation would preserve any significant historical information obtained and identify the scientific/historic research questions applicable to the resource, the data classes the resource is expected to possess, and how the expected data classes would address the applicable research questions. The results of the investigation shall be documented in a technical report that provides a full artifact catalog, analysis of items collected, results of any special studies conducted, and interpretations of the resource within a regional and local context. All technical documents shall be placed on file at the North Central Information Center of the California Historical Resources Information System. The results report shall include recommendations for archaeological and Native American monitoring in Environmentally Sensitive Areas and the protocol to follow should additional cultural materials be identified during construction activities.

Significance after Mitigation: Less than Significant.

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b) Whether the Project would disturb any human remains, including those interred outside of formal cemeteries.

Impact 3.6-2: The Project could disturb human remains, including those interred outside of formal cemeteries. (*Less than Significant with Mitigation Incorporated*)

Prehistoric archaeological sites may contain human burials. Based on the background research and surface survey there are no known locations in the Project Site that have been used for human burial purposes and thus no features of the Project would disturb known human remains. However, given the prehistoric archaeological sensitivity of the Project Site, the possibility of encountering human remains cannot be discounted. Additionally, coordination with the Pit River Tribe identified the potential for ancestral burial grounds within the Project Leasehold Area. Project-related disturbance of human remains would be a significant impact and could occur if, for example, grading, excavation, or soil borings associated with construction of facilities and infrastructure.

The potential for such impact would be reduced to a less-than-significant level through implementation of Mitigation Measure 3.6-2 (Inadvertent Discovery of Human Remains). The measure sets forth protocols for responding in the event that human remains are identified during ground disturbing activities, including halting construction, contacting the County Coroner to assess the find, among other appropriate actions (including contacting the most likely descendant).

Mitigation Measure 3.6-2: Inadvertent Discovery of Human Remains.

In the event human remains are uncovered during ground-disturbing activities (including construction, operations and maintenance, and decommissioning), the Project proponent or its contractor shall immediately halt work within a 100-foot radius, contact the Shasta County Coroner to evaluate the remains within 48 hours, and follow the procedures and protocols pursuant to Section 15064.5(e)(1) of the CEQA Guidelines. Health and Safety Code Section 7050.5 requires that no further disturbance shall occur until the County Coroner has made the necessary findings as to origin and disposition pursuant to Public Resources Code Section 5097.98. If the remains are determined to be of Native American descent, the coroner has 24 hours to notify the Native American Heritage Commission (NAHC). The NAHC will then identify the person thought to be the most likely descendent of the deceased Native American. The most likely descendent will make recommendations for means of treating, with appropriate dignity, the human remains and any associated grave goods as provided in Public Resources Code Section 5097.98.

Significance after Mitigation: Less than Significant

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c) Whether the Project would cause a substantial adverse change in the significance of a tribal cultural resource, defined in Pub. Res. Code §21074 as either a site, feature, place, cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is (1) listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Pub. Res. Code §5020.1(k) or (2) determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in Pub. Res. Code §5024.1(c).

Impact 3.6-3: The Project would cause a substantial adverse change in the significance of a tribal cultural resource. (*Significant and Unavoidable*)

CEQA requires the lead agency to consider the effects of a project on tribal cultural resources. As defined in Public Resources Code Section 21074, tribal cultural resources are sites, features, places, cultural landscapes, sacred places, and objects with cultural value to a California Native American tribe that are listed, or determined to be eligible for listing, on the national, state, or local register of historical resources.

Based on the background research described in Section 3.6.1.2, *Environmental Setting*, there is a prehistoric archaeological site in the Project Site. The prehistoric component of FW 11 is recommended as eligible for listing in the California Register and, for the purposes of CEQA, is considered a tribal cultural resource. In addition, Native American tribes have identified tribal cultural resources in the Project Site.

Tribal comments include concerns for the "numerous historical sites that are part of the region's Native American heritage…that should be protected and preserved." In addition, requests included that the "significance of known sites should be determined by the local tribal community." Hatchet Mountain, Bunchgrass Mountain and the surrounding other specific mountains and ridges, specifically views of Kohm Yamani (Snow Mountain) and Yet-Tey-Cha-Na (Lassen Peak) are considered to be of great spiritual significance to the Pit River Tribe, especially the Itsatawi, Madesi, and Atsugewi Bands. Tribal elders consider these locations sacred and continue to use numerous important spiritual and cultural sites within the region. Hatchet Mountain, Bunchgrass Mountain, Snow Mountain, and Lassen Peak do not occur within the Project Site and Project activities are not anticipated to have a direct effect to these features; however, indirect effects as a result of Project construction, operation, or decommissioning activities could occur. Other tribal cultural resources in the Project Site include unspecified locations of ethnographic trails and quarries; unspecified locations of ancestral burial grounds; unspecified areas where medicinal herbs were gathered; and wildlife that are traditionally important to the Pit River Tribe. In addition, the prehistoric component of FW 11 has been recommended eligible as a tribal cultural resource.

In the event that construction activities disturb tribal cultural resources, damage would be considered a significant impact. Implementation of Mitigation Measure 3.6-1 (Archaeological Research Design and Treatment Plan) described above, as well as Mitigation Measure 3.6-3 (Tribal Cultural Resources Interpretive Program) would ensure that impacts to tribal cultural resources are recognized. In consultation with the appropriate Native American representatives,

Mitigation Measure 3.6-3 also would provide for access to the area. However, unless a tribal cultural resource can be avoided and preserved in place according to the provisions set forth by Public Resources Code Section 21084.3, direct and indirect impacts to tribal cultural resources would not be reduced to a less-than-significant level and the impact would remain significant and unavoidable.

Mitigation Measure 3.6-3a: Implement Mitigation Measure 3.6-1: Archaeological Research Design and Treatment Plan (described above)

Mitigation Measure 3.6-3b: Coordination with the Pit River Tribe during Project Development.

Shasta County and the Applicant will facilitate a preconstruction meeting and field visit with the Pit River Tribe through the Tribe's chairperson and the Pit River Tribal Historic Preservation Officer to discuss "tribal cultural resources" as defined in Public Resources Code Section 21074 in the Project Site and identify ways to minimize impacts on these locations during construction. The site visit will focus on viewing the location of the Project facilities, describing Project construction and operation activities, and identifying potential cultural significant features.

Mitigation Measure 3.6-3c: Detailed Recordation of Features Considered Culturally Significant to the Pit River Tribe.

The Applicant shall retain a professional ethnographic consultant to undertake a detailed recordation of any locations considered important to the Pit River Tribe. The recordation will commence prior to construction and will include photographic documentation of pre- and post-construction conditions of any identified culturally sensitive location. The information gathered as a result of field, interview, and research tasks will be compiled into a report that will be transmitted to the Pit River Tribe. Detailed recordation of any ethnographic location in this manner will create a photographic and written record of the cultural resource prior to construction of the Project, resulting in partial compensation for Project impacts.

Mitigation Measure 3.6-3d: Cultural Resources Monitoring Program with the Pit River Tribe during Construction.

The Applicant shall offer and provide the opportunity for cultural resource monitors from the Pit River Tribe to monitor initial ground disturbing construction activities in areas identified by the Tribe as culturally sensitive. Monitors will have the authority to ensure that discrete sacred sites in the Project Site are avoided or that impacts on such localities are mitigated to the extent feasible, including but not limited to, avoidance or data recovery (as outlined in Mitigation Measure 3.6-1. Archaeological Research Design and Treatment Plan). The Pit River Environmental Office should coordinate with the appropriate Achumawi bands (Itsatawi and Madesi) to assign monitors.

If the offer is accepted, the Applicant shall provide compensation commensurate with market rates based on the qualifications and experience of the cultural monitor(s). Prior to tendering an offer to the Tribe the Applicant shall provide a copy of the offer to the County for review, including but not limited to the proposed number of monitors to be employed, proposed construction schedule/hours during which monitors would be present on site, proposed level(s) of compensation, and other relevant details of the proposed cultural monitoring program.

Significance after Mitigation: Significant and Unavoidable.

3.6.3.3 PG&E Interconnection Infrastructure

The Project would include interconnection infrastructure as described in Sections 2.4.2 and 2.4.3. These elements would include both overhead and underground collection system and potentially blasting activity to accommodate rocky terrain. Overhead collector systems (rather than trenched construction) would be implemented for stream and wetland crossings, to avoid steep terrain, and for other sensitive resource avoidance areas. Construction of the substation, switching stations, and interconnection components would include up to 19 acres of temporary disturbance, and 13 acres of permanent disturbance (including the footprints of the collector substation, switching station, graveled parking and maintenance areas). Because there are no known historical resources or unique archaeological resources in the area of permanent disturbance, the PG&E Interconnection Infrastructure would cause no impact relating to these considerations. Impacts to tribal cultural resources would be the same as the Project as a whole: significant and unavoidable with the implementation of Mitigation Measure 3.6-3a (implementation of the Archaeological Research Design and Treatment Plan that would be required by Mitigation Measure 3.6-1) and Mitigation Measure 3.6-3b (Tribal Cultural Resources Interpretive Program).

3.6.3.4 Direct and Indirect Effects of Alternatives

Alternative 1: South of SR 299

Under Alternative 1, South of SR 299, no turbines would be erected north of SR 299. Thus, Alternative 1 would avoid all impacts to recorded and unrecorded cultural and tribal cultural resources north of SR 299, if any such resources exist. There would be an overall reduced acreage of temporary and permanent disturbance, limited to a footprint defined in a smaller area with fewer turbines compared to the Project. However, as with the Project, Alternative 1 would require implementation of the same mitigation measures to reduce potential direct and indirect impacts associated with known cultural resources, including the prehistoric component of FW 11, which is considered a historical resource for the purposes of this analysis. Impacts to FW 11 would be significant and potentially reduced to a less-than-significant level with implementation of Mitigation Measure 3.6-1. In addition, impacts to tribal cultural resources would remain significant and unavoidable.

Alternative 2: Increased Setbacks

Under Alternative 2, the Increased Setback Alternative, there would be fewer turbines reducing overall temporary (construction-related) and permanent disturbance. Under the Increased Setback Alternative there would continue to be impacts to the prehistoric component of FW 11 and tribal cultural resources, similar to those described for the Project. The overall quantified disturbance area under Alternative 2 would be decreased compared to the Project. Alternative 2 would require implementation of the same protective measures and mitigation as the Project. Impacts to tribal cultural resources would remain significant and unavoidable.

No Project Alternative

If the No Project Alternative is implemented, none of the proposed wind turbines or associated infrastructure would be constructed, operated and maintained, or decommissioned on the Project Site, and none of the proposed above- or below-ground disturbance would occur. The proposed overhead and underground electrical collector system and communications lines would not be developed; and the meteorological towers, onsite collector substation, switching station, and operation and maintenance (O&M) facility would not be constructed. Laydown areas would not be cleared, no new access roads would be constructed, and no existing roads would be improved. The Project Site would continue to be operated as managed forest timberlands. Because there would be no change relative to baseline conditions, the No Project Alternative would create no impact related to cultural resources and to tribal cultural resources.

The Project Site is zoned for timber production. Pursuant to regulations implementing the California Timberland Productivity Act (Government Code §51100 et seq.; 14 Cal. Code Regs. §897[a]), there is a legal presumption that "timber harvesting is expected to and will occur on such lands." The regulations further specify that timber harvesting on such lands "shall not be presumed to have a Significant Adverse Impact on the Environment" (14 Cal. Code Regs. §898). Therefore, the No Project Alternative, including anticipated timber harvesting, is not presumed to result in a significant adverse individual or cumulative effect relating to cultural or tribal cultural resources. CAL FIRE would review any future timber harvesting proposal to evaluate any potential project-specific, site-specific environmental impacts.

3.6.4 Cumulative Analysis

The geographic scope for cumulative effects on archaeological resources and human remains includes projects in the Study Area (the Project Site and surrounding area that could be affected by visual or use changes on the Project Site) that would also involve excavation or similar ground disturbance in locations with previously recorded or as yet unknown archaeological resources, potentially with human remains. Similar to the Project as described under Impacts 3.6-2 and 3.6-3, cumulative projects identified in Section 3.1.2.1, *Cumulative Scenario*, in the project vicinity could have a significant impact on both recorded and unrecorded archaeological resources (including the prehistoric component of FW 11), including human remains interred outside of formal cemeteries, given the amount of construction-related ground disturbance that could occur for many of the cumulative projects. The potential impacts of the Project when considered together with similar impacts from other probable future projects in the vicinity could result in a significant cumulative impact on archaeological resources and human remains. The proposed Project's contribution to this impact could be cumulatively considerable, as documented above under Impacts 3.6-2 and 3.6-3. Mitigation Measures 3.6-1 and 3.6-2 would require implementation of legally required appropriate treatment of human remains as well as archaeological research and treatment to preserve the scientific value of an archaeological resource. Therefore, with implementation of **Mitigation Measures 3.6-1** and **3.6-2**, the proposed Project's contribution to cumulative impacts to archaeological resources and human remains would not be considerable, and the impact would be *less than significant with mitigation*.

The geographic scope for cumulative effects on tribal cultural resources includes the disturbance areas of past, other present, and reasonably foreseeable future projects within the Tribe's culturally affiliated area (Figure 3.6-1, *Pit River Tribe Ancestral Boundary*). Such projects include, for example, the existing Hatchet Ridge Wind Project, existing utility lines, timber harvest plans, active mining and reclamation projects, and any other projects that could detract from the character-defining qualities of tribal cultural resources that are traditionally important to the Pit River Tribe. Each of these project's incremental impacts would contribute to a significant adverse cumulative impact for purposes of this analysis. The Project's incremental Significant and Unavoidable impact, even with the implementation of Mitigation Measure 3.6-1 (Archaeological Research Design and Treatment Plan) and Mitigation Measure 3.6-3b (Tribal Cultural Resources Interpretive Program), would be cumulatively considerable.

3.6.5 References

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Stantec Consulting Services (Stantec), 2019. *Fountain Wind Energy Project Cultural Resources Phase 1 Inventory of 4,463 Acres, Shasta County, California.* Prepared for Fountain Wind LLC. December 2019.

Stantec, 2020a. *Addendum 1: Update to The Fountain Wind Energy Project Cultural Resources Phase 1 Inventory of 4,463 Acres, Shasta County, California.* Prepared for Fountain Wind LLC. March 18, 2020.

Stantec, 2020b. *Addendum 2: Updated Cultural Resources Inventory Report: Tribal Coordination and Correspondence.* Prepared for Fountain Wind LLC. March 23, 2020.

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3.7 Energy

This section identifies and evaluates issues related to Energy in the context of the Project and alternatives. It includes information about the physical and regulatory setting and identifies the criteria used to evaluate the significance of potential impacts, the methods used in evaluating these impacts, and the results of the impact assessment. The information presented in this analysis is based in part on the modeling results provided in **Appendix B**, *Air Quality and Greenhouse Gas Emissions*.

In response to its notice of intention to prepare this Draft EIR, the County received scoping input about energy efficiency and existing hydropower generation facilities (e.g., Pit #1 through Pit #7; hydropower plants located at Shasta Dam, the Spring Creek Power plant, Judge Francis Carr Powerhouse, Trinity Dam and Keswick Dam; and privately-owned hydropower plants including Balta on Battle Creek, Kilarc on Cow Creek, Hat Creek, Roaring Creek and Haynes Burney Creek). Scoping input also noted the existing Wheelabrator and cogeneration power plant facilities in Shasta County. Scoping commenters requested that the EIR consider fuel use for construction equipment, backup power generation, construction vehicles, and worker transportation to/from the Project Site as well as for vehicles idling on SR 299 during materials delivery and as required to start/re-start a turbine. Other comments requested disclosure of the difference between estimated and actual power generation from the turbines, including an explanation of the existing sources of energy that would be replaced by this Project; and consideration of whether water diverted for Project use would reduce the water going through existing hydropower plants and of the power loss that occurs when power is transmitted over long distances. All scoping input received, including regarding Energy, is provided in Section 4.1 of the Scoping Report, a copy of which is provided in **Appendix J**, *Scoping Report*.

The Project would not involve the use of natural gas; therefore, natural gas is not discussed in this section.

3.7.1 Setting

3.7.1.1 Study Area

The study area for Project impacts related to energy includes the State, the Pacific Gas & Electric Company (PG&E) service area, the County, and the areas surrounding the Project Site as relates to energy generation, energy consumption, and fuel consumption.

3.7.1.2 Environmental Setting

State Energy Setting

Total energy usage in California was 7,881 trillion British Thermal Units (Btus) in 2017 (the most recent year for which specific data are available), which equates to an average of 200 million Btu per capita. These figures place California second among the nation's 50 states in total energy use and 48th in per capita consumption (EIA, 2020a).

Electricity

In 2018, total system electric generation for California was 285,488 gigawatt-hours (GWh), down two percent from 2017's total generation of 292,037 GWh. Approximately 71 percent of the electrical power needed to meet California's demand is produced in the state; the balance, approximately 29 percent, is imported from the Pacific Northwest and the Southwest. In 2018, California's in-state electricity use was derived from natural gas (35 percent); coal (3 percent); large hydroelectric resources (11 percent); nuclear sources (9 percent); renewable resources that include geothermal, biomass, small hydroelectric resources, wind, and solar (31 percent); and unspecified sources (11 percent). Of the approximately 63,028 GWh generated from renewable sources in the state, solar-generated electricity made up the highest proportion (43 percent), followed by wind (22 percent), geothermal (18 percent), biomass (9 percent), and small hydroelectric (7 percent) (CEC, 2020a).

Wind-Generated Electricity

In 2018, California was the fifth-largest producer of wind energy in the U.S. California's wind power potential is widespread, especially along the state's many mountain crests, as well as in northern California coastal areas both onshore and offshore (EIA, 2020a). Six major wind resource areas, or particular areas in California containing a concentration of wind generation projects, and many smaller wind sites have been identified in the state. The Project Site is not located in one of these wind resource areas, but is located in close proximity to the Hatchet Ridge Wind Project also located in Shasta County, one of the smaller wind sites in the state (CEC, 2019). By the end of the third quarter of 2019, California had more than 5,800 megawatts (MW) of installed wind capacity (EIA, 2020a). The most recently reported wind generation peak of 5,309 MW was set in May 8, 2019, and a new overall renewable generation penetration peak was recorded on May 15, 2019, with approximately 80 percent of load served by all renewables (CAISO, 2019).

Transportation Fuels

Gasoline and diesel, both derived from petroleum (also known as crude oil), are the two most common fuels used for vehicular travel. Aviation gasoline, a specialized type of fuel used to power aircraft, also is derived from petroleum. According to the California Energy Commission (CEC), the state relies on petroleum-based fuels for 95 percent of its transportation needs (EIA, 2018). In 2019, approximately 30 percent of California's crude oil was produced within the state, about 12 percent was produced in Alaska, and the remaining 58 percent was produced in foreign lands (CEC, 2020b).

In 2019, taxable gasoline sales (including aviation gasoline) in California accounted for approximately 15.4 billion gallons of gasoline (CDTFA, 2020a), and taxable diesel fuel sales accounted for approximately 3.1 billion gallons of diesel fuel (CDTFA, 2020b). Statewide, there was an overall decrease in gasoline and diesel consumption from 2007 to 2011 due to the economic recession, but consumption has increased since then. The corona virus outbreak also is expected to decrease gasoline and diesel consumption throughout 2020.

California is nearly self-sufficient with regard to the gasoline, diesel, and aviation gasoline fuel supply, obtaining almost all of the supply to meet local demand from the California refineries

(CEC, 2014). Refineries in California often operate at or near maximum capacity because of the high demand for petroleum products. When unplanned refinery outages occur, replacement supplies must be brought in by marine tanker from refineries in the state of Washington or on the U.S. Gulf Coast. California requires that all motorists use, at a minimum, a specific blend of motor gasoline called CaRFG (California Reformulated Gasoline) as part of an overall program to reduce emissions from motor vehicles. Refineries in several other countries can also supply CaRFG, although it can take several weeks to locate and transport replacement motor gasoline that conforms to California's strict fuel specifications (EIA, 2020a). As a result, unplanned outages often result in a reduction in supply that causes prices to increase, sometimes dramatically. The severity and duration of these price spikes depend on how quickly the refinery issue can be resolved and how soon supply from alternative sources can reach the affected market (EIA, 2015).

Most petroleum supply disruptions or shortage events are resolved by the energy industry before they become significant. However, there are instances where the severity and scope of disasters require additional actions by the government to help facilitate and coordinate response and recovery efforts (NASEO, 2018).

Regional and Local Setting

PG&E is an investor-owned utility company that provides electricity supplies and services throughout a 70,000 square-mile service area that extends from Eureka in the north, to Bakersfield in the south, and from the Pacific Ocean in the west, to the Sierra Nevada mountains in the east. Shasta County is within PG&E's service area for electricity. Operating characteristics of PG&E's electricity supply and distribution systems are provided below. Also discussed is the regional consumption of transportation fuels.

PG&E Electric Utility Operations

PG&E provides "bundled" services (i.e., electricity, transmission and distribution services) to most of the six million customers in its service territory, including residential, commercial, industrial, and agricultural consumers. In recent years, PG&E has improved its electric transmission and distribution systems to accommodate the integration of new renewable energy resources, distributed generation resources, and energy storage facilities, and to help create a platform for the development of new Smart Grid technologies (PG&E, 2019).

In 2018, PG&E generated and/or procured a total of 48,832 gigawatt hours (GWh) of electricity.[1] Of this total, PG&E owns approximately 7,686 MW of generating capacity, itemized below (see **Table 3.7-1**). The remaining electrical power is purchased from other sources in and outside of California.

[1] This amount excludes electricity provided to direct access customers and Community Choice Aggregation (CCA) entities who procure their own supplies of electricity.

TABLE 3.7-1
PG&E-OWNED ELECTRICITY GENERATING SOURCES (2018)

Source	Generating Capacity (MW)
Nuclear (Diablo Canyon-2 reactors)	2,240
Hydroelectric	3,891
Fossil Fuel-Fired	1,400
Fuel Cell	3
Solar Photovoltaic (13 units;12 in Fresno County, 1 in Kings County)	152
Total	7,686

SOURCE: PG&E, 2019

Renewable Energy Resources

California law requires load-serving entities, such as PG&E, to gradually increase the amount of renewable energy they deliver to their customers to at least 33 percent of their total annual retail sales by 2020. This program, known as the Renewables Portfolio Standard (RPS) program, became effective in December 2011, and established three multi-year compliance periods that have gradually increasing RPS targets: 2011 through 2013, 2014 through 2016, and 2017 through 2020. After 2020, the RPS compliance periods will be annual.

Renewable generation resources, for purposes of the RPS program, include bioenergy such as biogas and biomass, certain hydroelectric facilities (30 MW or less), wind, solar, and geothermal energy. As shown in **Table 3.7-2**, during 2018, 38.9 percent of PG&E's energy deliveries were from renewable energy sources, exceeding the annual RPS target of 28.0 percent (PG&E, 2019).

TABLE 3.7-2
PG&E 2018 RENEWABLE ENERGY SOURCES

Source	Percent of Total Energy Portfolio
Bioenergy	4.4
Geothermal	3.7
Wind	10.0
RPS-Eligible Hydroelectric	2.7
Solar	18.1
Total	**38.9**

SOURCE: PG&E, 2019

Electricity Consumption

Table 3.7-3 shows electricity consumption by sector in the PG&E service area based on the latest available data from the CEC. As shown in the table, PG&E delivered approximately 80 billion kilowatt-hours (kWh) in 2018, of which approximately 30 billion kWh were consumed by commercial building uses.

TABLE 3.7-3
ELECTRICITY CONSUMPTION IN PG&E SERVICE AREA (2018)

Agricultural and Water Pump	Commercial Building	Commercial Other	Industry	Mining and Construction	Residential	Streetlight	Total Usage
All Usage Expressed in Millions of kWh (GWh)							
5,832	30,148	4,266	10,519	1,594	27,700	311	80,369

SOURCE: CEC, 2020c

In Shasta County, approximately 1.6 billion kWh of electricity was consumed in 2018, with approximately 821 million kWh consumed by non-residential uses (CEC, 2020c).

Local Energy Infrastructure

Existing electrical infrastructure in the Project vicinity includes transmission lines and PG&E's 500 kV Round Mountain Substation, which is located along Highway 299 approximately 2.7 miles west of the Project Site. The Round Mountain Substation is part of the Pacific Intertie, which is a vital transmission route between the Northwest and California. The Round Mountain Substation has an abundant amount of hydroelectric generation connected at the substation (PG&E, 2018). PG&E north-south direction 500 kV Transmission lines (Path 66 and a set of connecting wires to Path 15) run through the Round Mountain Substation. Other 220 kV to 287 kV PG&E transmission lines in the Project vicinity also run generally northeast from Round Mountain to Burney, including one that bisects the Project Site (PG&E, 2020).

As discussed above, there are multiple municipal hydropower plants in the Project area (Pit #1 through Pit #7) with additional hydropower plants throughout the County, including Spring Creek Power plant and Judge Francis Carr Powerhouse, and at Shasta Dam, Trinity Dam, and Keswick Dam; as well as privately owned hydropower, including Balta on Battle Creek, Kilarc on Cow Creek, Hat Creek, Roaring Creek, and Haynes Burney Creek. Wheelabrator, a biomass plant, and cogeneration power plant facilities are also located in Shasta County. The Hatchet Ridge Wind project is located within approximately 1 mile of the Project Site. These facilities include substations, transmission lines, and other infrastructure to connect to the energy grid.

Gasoline and Diesel

The CEC estimates that 87 million gallons of gasoline and approximately 50 million gallons of diesel were sold in 2018 in Shasta County and that there are 136 gasoline stations in the County (CEC, 2019).

3.7.1.3 Regulatory Setting

Federal

National Energy Conservation Policy Act

The National Energy Conservation Policy Act (NECPA, 42 USC §8201 et seq.) serves as the underlying authority for federal energy management goals and requirements and is the foundation of most federal energy requirements. NECPA established energy-efficiency standards for consumer projects and includes, among other things, energy-efficiency standards for new construction.

National Energy Policy Act of 2005

The National Energy Policy Act of 2005 (42 USC §13201 et seq.) sets equipment energy efficiency standards and seeks to reduce reliance on nonrenewable energy resources and provide incentives to reduce current demand on these resources. For example, under the act, consumers and businesses can attain federal tax credits for purchasing fuel-efficient appliances and products, including hybrid vehicles; and constructing energy-efficient buildings. Additionally, the act includes incentives for renewable energy production, including wind power.

Energy and Independence Security Act of 2007

The Energy and Independence Security Act of 2007 (42 USC §17001) sets federal energy management requirements in several areas, including energy reduction goals for federal buildings, facility management and benchmarking, performance and standards for new buildings and major renovations, high-performance buildings, energy savings performance contracts, metering, energy-efficient product procurement, and reduction in petroleum use, including by setting automobile efficiency standards, and increase in alternative fuel use. This act also amends portions of the National Energy Policy Conservation Act, described above.

Corporate Average Fuel Economy Standards

Section 3.10, *Greenhouse Gas Emissions*, details federally established fuel economy standards by the U.S. Environmental Protection Agency (USEPA) and National Highway Traffic Safety Administration (NHTSA). NHTSA's Corporate Average Fuel Economy (CAFE) standards regulate how far vehicles must travel on a gallon of fuel. NHTSA sets CAFE standards for passenger cars and for light trucks (collectively, “light-duty vehicles”), and separately sets fuel consumption standards for medium- and heavy-duty trucks and engines. In the course of more than 30 years, this regulatory program has resulted in improved fuel economy throughout the United States’ vehicle fleet (NHTSA, 2014, 2019).

State

Warren-Alquist Act

The 1975 Warren-Alquist Act (Pub. Res. Code §25000 et seq.) established the California Energy Resources Conservation and Development Commission, now known as the CEC. The Act established a State policy to reduce wasteful, uneconomical, and unnecessary uses of energy by

employing a range of measures. The Act also was the driving force behind the creation of Appendix F to the CEQA Guidelines.

State of California Integrated Energy Policy

Public Resources Code Section 25301(a) requires the CEC to develop an integrated energy plan at least every 2 years for electricity, natural gas, and transportation fuels. The plan calls for the State to assist in the transformation of the transportation system to improve air quality, reduce congestion, and increase the efficient use of fuel supplies with the least environmental and energy costs. An overarching goal of the resulting Integrated Energy Policy Report (IEPR) is to achieve the statewide greenhouse gas (GHG) emission reduction targets, while improving overall energy efficiency. See, for example, the CEC's 2019 Integrated Energy Policy Report Update, which includes integrating renewable energy, including wind, as a key component (CEC, 2020d).

Renewables Portfolio Standard

The State of California adopted standards to increase the percentage that retail sellers of electricity, including investor-owned utilities and community choice aggregators, must provide from renewable resources. The standards are referred to as the RPS. Qualifying renewables under the RPS include bioenergy such as biogas and biomass, small hydroelectric facilities (30 MW or less), wind, solar, and geothermal energy. The California Public Utilities Commission (CPUC) and the CEC jointly implement the RPS program. The CPUC's responsibilities include: (1) determining annual procurement targets and enforcing compliance; (2) reviewing and approving each investor-owned utility's renewable energy procurement plan; (3) reviewing contracts for RPS-eligible energy; and (4) establishing the standard terms and conditions used in contracts for eligible renewable energy (CPUC, 2020).

Executive Orders S-14-08 and S-21-09

In November 2008, Governor Schwarzenegger signed Executive Order S-14-08, which expanded the State's RPS to 33 percent renewable power by 2020. In September 2009, Governor Schwarzenegger continued California's commitment to the RPS by signing Executive Order S-21-09, which directed the California Air Resources Board under its Assembly Bill (AB) 32 authority to enact regulations to help the State meet its RPS goal of 33 percent renewable energy by 2020.

Senate Bill 350 – Clean Energy and Pollution Reduction Act of 2015

Senate Bill (SB) 350, known as the Clean Energy and Pollution Reduction Act of 2015, was enacted on October 7, 2015. It provides a new set of objectives in clean energy, clean air, and pollution reduction by 2030. The objectives include the following:

1. To increase from 33 percent to 50 percent by December 31, 2030, the procurement of electricity from renewable sources.
2. To double the energy efficiency savings in electricity and natural gas final end uses of retail customers through energy efficiency and conservation.

Senate Bill 100 and Executive Order B-55-18

On September 10, 2018, Governor Brown signed SB 100, establishing that 100 percent of all electricity in California must be obtained from renewable and zero-carbon energy resources by December 31, 2045. SB 100 also created new standards for the RPS goals that were established by SB 350 in 2015. Specifically, the bill increases required energy from renewable sources for both investor-owned and publicly-owned utilities from 50 percent to 60 percent by 2030. Incrementally, these energy providers are also required to have a renewable energy supply of 33 percent by 2020, 44 percent by 2024, and 52 percent by 2027. The updated RPS goals are considered achievable, since many California energy providers are already meeting or exceeding the RPS goals established by SB 350.

On the same day that SB 100 was signed, Governor Brown signed Executive Order B-55-18 with a new statewide goal to achieve carbon neutrality (zero-net GHG emissions) by 2045 and to maintain net negative emissions thereafter.

Energy-efficient Building Standards

The Energy Efficiency Standards for Residential and Nonresidential Buildings specified in Title 24, Part 6 of the California Code of Regulations include requirements for non-residential building lighting, insulation, ventilation, and mechanical systems (CEC, 2018). Its provisions would be relevant to the Project's proposed O&M building.

The California Green Building Standards Code (CALGreen, Title 24 Part 11) is a statewide regulatory code for all buildings. CALGreen is intended to encourage more sustainable and environmentally friendly building practices, require use of low-pollution emitting substances that cause less harm to the environment, conserve natural resources, and promote the use of energy-efficient materials and equipment (CBSC, 2019).

Local

Shasta County General Plan

The Energy Element of the Shasta County General Plan identifies the potential for development of wind as an alternative source of energy production in the County. The objectives and policy that would apply to the Project related to energy are provided below (Shasta County, 2004).

> **Objective E-2:** Increase utilization of renewable energy resources by encouraging development of solar, hydroelectric, biomass, waste-to-energy, and cogeneration sources.
>
> **Objective E-4:** Conserve nonrenewable energy resources, specifically raw materials, transportation fuels, and resource land area.
>
> **Policy E-c:** The County should develop energy thresholds and standards which assist applicants for development projects in designing conservation features into their proposals. Energy threshold standards could also be used to assist in the evaluation of potential energy consumption impacts which may be environmentally significant.

3.7.2 Significance Criteria

CEQA Guidelines Appendix G Section VI identifies considerations relating to energy. See Section 3.1.4, *Environmental Considerations Unaffected by the Project or Not Present in the Project Area*, as it relates to the County's analysis of the potential impacts of this Project relating to the energy considerations suggested in CEQA Guidelines Appendix G. Otherwise, for purposes of this analysis, a project would result in a significant impact to energy if it would:

a) Result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction, operation and maintenance, or decommissioning.

3.7.3 Direct and Indirect Effects

3.7.3.1 Methodology

This impact analysis evaluates the potential for the Project to result in a substantial increase in energy demand, consistent with Public Resources Code Section 21100(b)(3), and/or wasteful use of energy during Project construction and operation. The impact analysis is informed by CEQA Guidelines Appendix F. Though the analysis provides construction, operational, and decommissioning energy use estimates for the Project, the impacts are analyzed based on an evaluation of whether this energy use would be considered excessive, wasteful, or inefficient taking into account required compliance with applicable standards and policies aimed to reduce energy consumption. Energy emissions detail supporting the Project estimates presented in this section are also presented in Section 3.10, *Greenhouse Gas Emissions*.

3.7.3.2 Direct and Indirect Effects of the Project

a) Whether the Project would result in potentially significant environmental impact due to wasteful, inefficient, or unnecessary consumption of energy resources, during project construction, operation and maintenance, or decommissioning.

Impact 3.7-1: Project construction, operation and maintenance, and decommissioning and site reclamation could result in the wasteful, inefficient, or unnecessary consumption or use of energy. (*Less-than-Significant Impact*)

Construction, Decommissioning, and Site Reclamation

The analysis in this section utilizes the assumptions identified in Appendix B, *Air Quality and Greenhouse Gas Emissions*. Because the California Emissions Estimator Model (CalEEMod) program and other sources used in this technical analysis does not display the amount and fuel type for construction-related sources, additional calculations were conducted and are summarized in **Tables 3.7-4** and **3.7-5** below and provided in **Appendix E**, *Energy: Fuel Use Calculations*.

TABLE 3.7-4
PROJECT ENERGY CONSUMPTION DURING CONSTRUCTION

Type (use)	Quantity	Units	Energy (MBtu)[a]
Diesel (construction equipment and trucks)	876,933	gallons	120,474
Gasoline (worker vehicles)	87,253	gallons	10,495
Aviation gasoline (construction helicopter use)	15,380	gallons	1,849
Electricity (water-related)	55,883	kWh	191
Total	**-**	**-**	**133,009**

NOTES:
MBtu = million British thermal unit
kWh = kilowatt-hours

[a] Based on U.S. Energy Information Administration (EIA) conversion factors.

SOURCE: Data compiled by Environmental Science Associates in 2020 (Appendix E); EIA, 2020b.

TABLE 3.7-5
PROJECT ENERGY CONSUMPTION DURING OPERATION

Type (use)	Quantity	Units	Energy (MBtu)[a]
Electricity			
O&M building	48,157	kWh/year	164
Diesel			
Maintenance equipment and crane trucks, Emergency Generator	10,402	gallons/year	1,429
Gasoline			
O&M employee vehicles	15,542	gallons/year	1,869
Propane			
O&M building heating	1,000–2,000	gallons/year	183
Total	**-**	**-**	**3,646**

NOTES:
MBtu = million British thermal unit
kWh = kilowatt-hours

[a] Based on U.S. Energy Information Administration (EIA) conversion factors.

SOURCE: Data compiled by Environmental Science Associates in 2020 (Appendix E); EIA, 2020b.

Project construction activities include timber removal and grubbing, grading and access road work, temporary concrete batch plant construction, foundation work, turbine and transformer installation, substation and O&M building installation, underground and overhead connector system work, transmission line connection, and substation aggregate and security fence installation. Construction of the Project would occur over an up-to 24-month period and would result in fuel consumption from the use of construction tools and equipment (e.g., graders, excavators, scrappers), from haul truck trips required to deliver materials and equipment to the site, potentially from helicopter use during the overhead collection system and transmission line connection phases, and from vehicle trips generated from construction workers traveling to and

from the site. Vehicle emissions used to derive fuel use include running, startup, and idling emissions. Project construction is expected to consume a total of approximately 876,933 gallons of diesel fuel from construction equipment and haul truck trips, approximately 87,253 gallons of gasoline from construction worker vehicle trips, and approximately 15,380 gallons of aviation gasoline from helicopter use. Project fuel use during construction would represent approximately 0.1 percent of gasoline and 1.6 percent of diesel sold in Shasta County in 2018 (CEC, 2019). Project gasoline and aviation gasoline use would represent approximately 0.0007 percent of taxable gasoline sales (including aviation gasoline) in California in 2019 (CDTFA, 2020a). Aviation gasoline use would be minimal considering the limited duration of activity, which was assumed to last approximately six working days during conductor installation. Gasoline would be obtained by workers from among the 136 gas stations in the County. Diesel for haul truck trips required to deliver materials and equipment to the site would be obtained by truck drivers along their transport routes, including Shasta County and other jurisdictions along the route from the Port of Stockton, as necessary. Diesel for construction and transportation equipment during construction would be stored on-site in aboveground tanks, and would be replenished by commercial vendors as necessary. Aviation gasoline would be procured at the airport from which the helicopter takes-off and lands, which likely would be the Redding Municipal Airport or Fall River Mills Airport.

Construction activities and the corresponding fuel energy consumption would be temporary and localized, as this level of diesel fuel and gasoline use would not be a typical condition of the Project. In addition, there are no unusual Project characteristics that would cause the use of construction equipment that would be less energy efficient compared with other similar construction sites in other parts of the state.[2] Helicopters also often are used during construction to string overhead power lines. Therefore, construction-related fuel consumption by the Project would not result in inefficient, wasteful, or unnecessary energy use compared with other, similar construction in the region.

As discussed in Section 3.12, *Hydrology and Water Quality*, water use during construction would amount to a total of up to 49 acre-feet and would likely be obtained from groundwater resources, either sourced from wells on-site or purchased and delivered to the Project Site. Electricity associated with the supply, distribution, and treatment of water used for construction would be approximately 55,883 kWh over the 2-year construction period.[3] This energy consumption would be approximately 0.004 percent of the electricity consumption for the mining and construction sector in PG&E's service area in 2018 (CEC, 2020c). Additionally, as shown in Table 3.7-1, the total energy consumption during the two-year construction period would be approximately 133,009 MBtu, which is less than 0.01 percent of statewide energy use as of 2017. Therefore, construction-related indirect electricity consumption by the Project would not result in inefficient, wasteful, or unnecessary energy use.

[2] Since energy consumption is directly proportional to GHG emissions generation, the Project's construction-related GHG were compared to the Humboldt Wind Energy Project's GHG emissions (Humboldt County, 2019) because the Humboldt Wind project provides the most current, relevant estimate known of a wind project construction site elsewhere in the state.

[3] Based on the CalEEMod energy intensity of 0.0035 kWh per gallon for supply, distribution, and treatment of water for Shasta County.

Operation and Maintenance

The Project would receive service power from PG&E, and would have an emergency generator available on-site. A small amount of electricity would be consumed by the Project to operate lights, telecommunications devices associated with the Supervisory Control and Data Acquisition (SCADA) system, which provides communication capabilities between turbine locations, substation, and operations and maintenance facilities, and other electronic equipment. For operational activities, annual electricity consumption was calculated using demand factors for a general heavy industry type building, because CalEEMod does not provide demand factors specifically for wind O&M facilities, as shown in the CalEEMod output in Appendix B. The Project's energy consumption was estimated to be approximately 48,157 kWh of electricity per year. This energy consumption would be less than 0.001 percent of the electricity consumption for the industrial sector in PG&E's service area in 2018 (CEC, 2020c). Using the Project's total nameplate generating capacity of up to 216 MW and conservatively assuming an average capacity factor of 32 percent,[4] the Project would be anticipated to generate up to approximately 605,491,200 kWh per year.[5] Thus, the minimal amount of electricity required during Project operation would be greatly offset by the generation of electricity from the Project, and the Project's electricity demand would not constitute a wasteful, inefficient, or unnecessary use of energy.

Operation and maintenance would require the use of utility vehicles, cranes, and other maintenance-related equipment. No other heavy equipment would be used during normal Project operation. Non-routine maintenance such as repair or replacement of rotors or other major components, if needed, could involve use of one or more cranes and equipment transport vehicles. Cranes for maintenance would not be as large as the track-mounted cranes needed to erect the turbine towers. Additionally, permanent access roads would be graded and compacted periodically to minimize erosion. Crane trucks and other maintenance equipment (i.e., mowers) may require the use of diesel fuel. Project diesel use from equipment is estimated to be 10,402 gallons per year, and would represent approximately 0.02 percent of diesel sold in Shasta County in 2018 (CEC, 2019). As outlined in Chapter 2, *Description of Project and Alternatives*, the Applicant would develop an O&M protocol to be implemented throughout Project operation. This protocol would specify routine turbine maintenance and operation in accordance with the maintenance requirements prescribed by the turbine manufacturer. Thus, the amount of diesel fuel consumed during Project operation would be relatively minimal and would not constitute a wasteful, inefficient, or unnecessary use of energy.

The Project would require approximately 12 full-time personnel on-site for operation and maintenance. While performing most routine maintenance activities, O&M staff would travel via pickup or other light-duty trucks using gasoline. Gasoline also would be required by Project workers commuting to and from the Project Site. The total mobile emissions rates (Appendix B) during operation yield a conservative estimate of 15,542 gallons of gasoline required annually

4 Conservatively based on a 32 percent average capacity factor. Note that the average 2018 capacity factor among projects built from 2014 to 2017 was 41.9 percent, compared to an average of 30.8 percent among all projects built from 2004 to 2011, and 23.8 percent among all projects built from 1998 to 2001 (U.S. Department of Energy, 2018).

5 Note that electricity transmission and distribution losses averaged about 5 percent of the electricity that was transmitted and distributed in 2018 in California (EIA, 2019). With these losses taken into consideration, the Project would supply up to approximately 575,216,640 kWh per year.

during Project operation. The gasoline consumption by Project workers would be approximately 0.02 percent of gasoline consumed in Shasta County in 2018 (CEC, 2019). Therefore, the gasoline use during Project operation would not constitute a wasteful, inefficient, or unnecessary use of energy.

Additionally, the emergency generator for the O&M building would require diesel fuel during operation. Assuming 100 hours of operational use per year, the Project would use approximately 100 gallons of diesel fuel during operation. The O&M building would also use propane for ambient heating. Approximately 500 to 1,000 gallons would be stored in an aboveground propane storage vessel. Assuming the propane tank would need to be refilled twice per year, the Project would use approximately 1,000 to 2,000 gallons of propane per year during operation. Diesel fuel and propane use during operation would be minimal, and fuel levels would be replenished on-site by commercial vendors as necessary. Therefore, the diesel and propane fuel use during Project operation would not constitute a wasteful, inefficient, or unnecessary use of energy.

Additionally, as shown in Table 3.7-2, the Project's total annual energy consumption would be approximately 3,646 MBtu, which is less than 0.0001 percent of statewide energy use in 2017. The Project would also be anticipated to generate up to approximately 605,491,200 kWh per year, or 2,065,936 MBtu, which represents 0.03 percent of statewide energy use in 2017. Therefore, the energy use during Project operation would not constitute a wasteful, inefficient, or unnecessary use of energy. This impact would be less than significant.

Decommissioning and Site Restoration

The Project is anticipated to be in commercial operation for approximately 40 years from the commencement of operation as would be allowed under the requested terms of the use permit, although upgrading and replacing equipment could extend the operating life of the wind energy facility indefinitely. Proposed decommissioning of existing facilities and infrastructure and reclamation of the Project Site would require approximately 18 to 24 months. The types of equipment, vehicles, and workforce necessary for decommissioning and reclamation activities at the Project Site would be similar to the requirements for construction, except considerably less intensive in that no concrete batch plant(s), cable delivery, or concrete trucks would be required, and no cable trenching or similar work would occur. Moreover, existing service roads would be used; no new access roads or road widening would be required. Decommissioning and site reclamation activities and corresponding fuel energy consumption would be temporary and would be comparable to the construction-related fuel demand. Decommissioning- and site reclamation-related fuel use would also not represent a substantial demand on energy resources. Thus, decommissioning-related fuel consumption by the Project would not result in inefficient, wasteful, or unnecessary energy use compared with other construction sites in the region.[6] This impact would be less than significant.

Mitigation: None required.

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6 See Footnote 2.

3.7.3.3 PG&E Interconnection Infrastructure

Upgrades to PG&E facilities to facilitate the interconnection between the Project's electricity and the PG&E transmission lines are anticipated to include construction and/or reconfiguration of utility line structures and transmission line circuits involving four to six new transmission poles. If required, these new poles would be located adjacent to the proposed substation and switching station. The construction equipment, workers, vehicle trips, and fuel required for upgrades to these facilities would be minimal compared to overall Project construction activities, and are captured by the Project's calculations. Therefore, activities associated with the PG&E interconnection infrastructure would result in a less-than-significant impact relating to energy.

3.7.3.4 Direct and Indirect Effects of Alternatives

Alternative 1: South of SR 299

Under Alternative 1, the Project would be constructed, operated and maintained, and ultimately decommissioned as proposed south of SR 299, and none of the up to seven turbines proposed to the north of SR 299 (turbine numbers A01 through A07) or related infrastructure would be developed. Alternative 1 would have a total nameplate generating capacity of up to 195 MW, which equates to approximately 21 MW less nameplate generating capacity as compared to the Project. The number of workers and durations of construction, operation and maintenance, and decommissioning and site reclamation would be substantially the same as for the Project, resulting in similar fuel and electricity use which would continue to be offset by the Project's energy generation. Alternative 1 would continue to provide a new source of renewable energy supporting SB 100 and the State's energy goals, although with less overall capacity than the Project. Overall, Alternative 1 would result in no significant impacts to energy; impact conclusions would be the same as those identified for the Project.

Alternative 2: Increased Setbacks

Under Alternative 2, proposed setbacks would be increased relative to the Project to preclude turbine construction within three times the height of the turbine (i.e., within 2,037 feet) of a residential property line and within 1.5 times the height of the turbine (i.e., within 1,018.5 feet) of State Route 299, any other publicly-maintained public highway or street, and of Supan Road or Terry Mill Road. This would remove four wind turbines, as compared to the Project, resulting in the loss of approximately 12 MW to 22.8 MW of generating capacity based on generation potential per turbine. Under Alternative 2, the number of workers and durations of construction, operation and maintenance, and decommissioning and site restoration would be substantially the same as for the Project, resulting in similar fuel and electricity use, which would continue to be offset by the Project's energy generation. Alternative 2 would continue to provide a new source of renewable energy supporting SB 100 and the State's energy goals, although with less overall capacity than the Project. Overall, Alternative 2 would result in no significant impacts to energy; impact conclusions would be the same as those identified for the Project.

No Project Alternative

If the No Project Alternative is implemented, none of the proposed wind project infrastructure would be delivered to the Project Site, and there would be no Project-related construction, operation and maintenance, or decommissioning there. No construction-related equipment or additional vehicle trips would be made to, from, or within the Project Site relative to baseline conditions for a wind project purpose. Fuel and electricity use associated with the Project would not occur. The Project Site would continue to be operated as managed forest timberlands. Because there would be no change relative to baseline conditions, the No Project Alternative would create no impact related to energy. However, under the No Project Alternative, a new source of renewable energy supporting SB 100 and the State's energy goals would not be provided.

The Project Site is zoned for timber production. Pursuant to regulations implementing the California Timberland Productivity Act (Government Code §51100 et seq.; 14 Cal. Code Regs. §897[a]), there is a legal presumption that "timber harvesting is expected to and will occur on such lands." The regulations further specify that timber harvesting on such lands "shall not be presumed to have a Significant Adverse Impact on the Environment" (14 Cal. Code Regs. §898). Therefore, the No Project Alternative, including anticipated timber harvesting, is not presumed to result in a significant adverse individual or cumulative effect relating to energy. CAL FIRE would review any future timber harvesting proposal to evaluate any potential project-specific, site-specific environmental impacts.

3.7.4 Cumulative Analysis

The geographic context for potential cumulative impacts related to electricity is within PG&E's service area and for equipment and vehicle fuel use is within the Project's construction workers' commute radius (assumed to be approximately 50 miles) and jurisdictions along the route from the Port of Stockton (assumed to be approximately 270 miles), where major Project components would likely be delivered and transported to the Project Site from, since these are the areas within which energy resources would be demanded and supplied for the Project. The Project would use energy resources during initial construction, operation and maintenance, and decommissioning/ reclamation; therefore, it could contribute to potential cumulative impacts during any of these phases.

Regarding electricity, there is no existing significant adverse condition that would be worsened or intensified by the Project or an alternative. To the contrary, both the Project and Alternatives 1 and 2 would provide an additional source of renewable energy that could serve the cumulative demand. No significant adverse cumulative effect would result relating to electricity use; instead, a beneficial cumulative impact on energy resources would result.

Similarly regarding the efficiency of fuel use, there is no existing significant adverse condition (such as a shortage) that would be worsened or intensified by the Project or an alternative. Past, present, and reasonably foreseeable future projects within approximately 50 miles of the Project

Site could require gasoline and within approximately 270 miles of the Project Site could require diesel, but would not combine with the fuel demands of the Project to cause a significant adverse cumulative impact relating to the wasteful, inefficient, or unnecessary consumption or use of fuel. In the event of a future shortage, higher prices at the pump would curtail unnecessary trips that could be termed "wasteful" and would moderate choices regarding vehicles, equipment, and fuel efficiency. Under these conditions, the Project's less-than-significant impacts relating to wasteful, inefficient, or unnecessary consumption or use of fuel would not cause a significant cumulative impact.

3.7.5 References

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3.8 Forestry Resources

This section identifies and evaluates issues related to Forestry Resources in the context of the Project and alternatives. It includes information about the physical and regulatory setting and identifies the criteria used to evaluate the significance of potential impacts, the methods used in evaluating these impacts, and the results of the impact assessment. Information about Agricultural Resources is presented in Section 3.1.3, *Environmental Topics Removed from Consideration*.

In response to its notice of intention to prepare this Draft EIR, the County received scoping input noting that the site is subject to herbicide use and thinning under existing (baseline) conditions. Scoping comments also expressed concern that the development of a wind project on the proposed site would result in: (1) tree removal on a much greater scale than if commercial timber harvesting were to continue, and (2) conversion to non-timber-producing use, where the forest conversion could lead to loss of nutrient-rich topsoils, disrupted nutrient cycling, and increased erosion. These issues are addressed in Section 3.8.3, *Direct and Indirect Effects*. All scoping input received, including regarding Forestry Resources, is provided in Section 4.1 of the Scoping Report, a copy of which is provided in **Appendix J**, *Scoping Report*.

3.8.1 Setting

3.8.1.1 Study Area

The study area for the purposes of this analysis of potential impacts to Forestry Resources includes all lands within the Project Site, as defined in Chapter 2, that may be subject to temporary and permanent disturbance.

3.8.1.2 Environmental Setting

The Shasta County General Plan designates the Project Site as Timber (T); the zoning designations are Timber Production (TP) (approximately 4,457 acres) and Unclassified (U) (approximately 6 acres). Existing land uses within the Project Site consist exclusively of managed forest lands. Unpaved logging roads and transmission lines cross the Project Site. Little Cow Creek and the south fork of Montgomery Creek cross the Project Site from east to west. The Lassen National Forest lies to the southeast, and the Shasta-Trinity National Forest is to the north. Other surrounding lands are privately owned; many are used for timber harvesting purposes. Additional information on Project Site-specific ecology and vegetation composition can be found in Section 3.4 *Biological Resources*.

3.8.1.3 Regulatory Setting

Federal

No federal regulations govern Forestry Resources in the study area.

State

The Z'Berg-Nejedly Forest Practice Act of 1973 (Pub. Res. Code §§4511–4360.2) and its implementing regulations, the Forest Practice Rules (14 Cal. Code Regs. §895 et seq.), govern the management of privately owned forestlands in California. Section 4526 of the Z'Berg-Nejedly Forest Practice Act defines "timberland" as "land, other than land owned by the federal government and land designated by the board as experimental forest land, which is available for, and capable of, growing a crop of trees of a commercial species used to produce lumber and other forest products, including Christmas trees. Commercial species shall be determined by the board on a district basis." Under the Forest Practice Rules, landowners who wish to harvest and then sell their trees must submit and comply with an approved state-issued timber harvesting permit. The most common permit for the harvest and eventual sale of trees is a Timber Harvesting Plan (THP), which describes the scope, yield, harvesting methods, and mitigation measures that a timber harvester intends to perform within a specified geographical area over a period of five years (Taylor, 2018).

Local

Shasta County General Plan

The Timberlands Element of the Shasta County General Plan contains the following objectives pertaining to forest resource management (Shasta County, 2004):

> **T-1:** Preservation of timberlands suitable for forest management and production to allow for the continuation of such uses or to provide opportunities for the future establishment of such uses.
>
> **T-2:** Protection of timberlands from incompatible adjacent land uses which adversely impact forest management activities.

Shasta County Zoning Ordinance

Chapter 17.08, Timber Production District, in the Shasta County Zoning Ordinance (Shasta County, 2020) lists the uses permitted in the TP district if a use permit is issued, including "the erection, construction or alteration of a gas, electrical, water or communication facility, or other public improvements, in accordance with Government Code §51152."

3.8.2 Significance Criteria

CEQA Guidelines Appendix G Section II identifies considerations relating to Agriculture and Forestry Resources. See Section 3.1.4, *Environmental Considerations Unaffected by the Project or Not Present in the Project Area*, as it relates to the County's analysis of the potential impacts of this Project to the considerations suggested in CEQA Guidelines Appendix G Section II. Otherwise, for purposes of this analysis, a project would result in a significant impact to Forestry Resources, including timberland, if it would:

a) Result in the loss of forest land or conversion of forest land to non-forest use.

In determining whether the Project would result in a significant environmental impact to Forestry Resources, Shasta County has considered information compiled by the California Department of Forestry and Fire Protection regarding the state's inventory of forest land.

3.8.3 Direct and Indirect Effects

3.8.3.1 Methodology

The evaluation of potential impacts of the Project on Forestry Resources was based on a review of field conditions, aerial photographs, and policy guidance from the Shasta County General Plan and the Shasta County Zoning Code. For purposes of this analysis, permanent disturbance (and impacts) would occur in those areas that would remain cleared and in use throughout Project operations, regardless of whether they are returned to original use after decommissioning. Temporary disturbance would occur during construction in areas that would be restored to their pre-disturbance condition following construction and would remain undisturbed throughout the operation and maintenance phase of the Project. Temporary disturbance could occur again during decommissioning in advance of site restoration. In this analysis, "conversion" of timberland equates to permanent disturbance. While Project-related timber conversion would be considered permanent, the Project Site is expected to be returned to timberland use following the conclusion of the Use Permit term.

The impacts of timber removal, whether temporary or permanent, are analyzed on a resource-by-resource basis throughout this EIR as an aspect of the site preparation and construction phase. Existing commercial and pre-commercial timber would be harvested, treated, and/or removed from the Project Site to allow development of the Project during this first phase of Project implementation. Areas that would be removed from timber production as a result of the Project would be harvested in accordance with TCP and THP authorization from CAL FIRE. The THP would be drafted in accordance with requirements set forth in the Forest Practice Act (Pub. Res. Code §4582) and the Forest Practice Rules (CAL FIRE, 2019), would be prepared by a Registered Professional Forester, and would be carried out by licensed timber operators. The THP would specify the location of timber to be harvested, how it would be harvested, and environmental Best Management Practices (BMPs) that would be implemented during harvesting. The Applicant would provide the County with written documentation of CAL FIRE's approval of the THP prior to the commencement of onsite activities.

3.8.3.2 Direct and Indirect Effects of the Project

a) Whether the Project would result in the loss of forest land or conversion of forest land to non-forest use.

Impact 3.8-1: The Project could result in the loss of forest land or conversion of forest land to non-forest use. (*Less-than-Significant Impact*)

Although BMPs would be implemented as part of the Project, Project implementation nonetheless would result in the temporary disturbance of up to 1,384 acres of timberland during construction and the permanent conversion of up to 713 acres of timberland as reported in Table 2-1, *Project*

Components and Disturbance Areas. Existing commercial and pre-commercial timber would be harvested, treated, and/or removed from the Project Site to allow development of the Project. Areas that would be removed from timber production as a result of the Project would be harvested in accordance with a Timberland Conversion Permit (TCP) and THP authorization from the California Department of Forestry and Fire Protection (CAL FIRE).

Trees would be replanted within temporary disturbance areas following the completion of construction. Further, as described in Section 2.4.7, *Decommissioning and Site Restoration*, the Applicant proposes to recontour and revegetate the Project Site upon completion of the Project's operational life to be as similar to preconstruction conditions as possible, including, in coordination with the land owner, replanting disturbed areas with trees or other vegetative cover consistent with the landowner's current and future land use practices.

Of the 2,428,000 total acres that comprise Shasta County (Shasta County, 2004), 59 percent or 1,454,6800 acres are dedicated to commercial forest uses (Shasta County Planning Division, 2020). Removal of up to 713 acres of forest lands would result in a reduction of less than 0.05 percent of the commercial forest lands in Shasta County. Additionally, the timber harvest within the Project Site would overlap five active or completed THPs, which could result in fewer acres of conversion by the Project than projected for purposes of this analysis (ConnectGen, 2019). Given the Project's minimal contribution to net forest loss during and after construction of the Project, the impact would be less than significant. No mitigation is required.

Mitigation: None required.

3.8.3.3 PG&E Interconnection Infrastructure

Construction of the substation, switching station, and interconnection facilities would temporarily disturb up to approximately 19 acres of the Project Site; the permanent area of disturbance would be approximately 5 acres for the collector substation and 8 acres for the switching station. This acreage is accounted for in the Project Site acreage. Construction, operation, management, and site decommissioning and restoration associated with the PG&E interconnection infrastructure would result in a less than significant impact relating to the loss of forest land or conversion of forest land to non-forest use.

3.8.3.4 Direct and Indirect Effects of Alternatives

Alternative 1: South of SR 299

Under Alternative 1, the South of SR 299 Alternative, the approximately 4,086 acres located south of SR 299, would be utilized for the Project, while approximately 378 acres of the Project Site located north of SR 299 would continue to be managed for timber production. Alternative 1 would result in similar, but slightly reduced, direct and indirect impacts as the Project. Due to the elimination of 378 acres of the Project Site from development, Alternative 1 would reduce temporary impacts to commercial forest lands by 9 percent, from 1,384 acres to 1,259 acres.

Permanent impacts would be reduced by 8 percent, from 713 acres to 652.5 acres. Therefore, although the impacts of Alternative 1 would be slightly reduced relative to the Project, the impact conclusion would remain the same: less than significant.

Alternative 2: Increased Setbacks

Under Alternative 2, proposed setbacks would be increased relative to the Project to preclude turbine construction within three times the height of the turbine (i.e., within 2,037 feet) of a residential property line and within 1.5 times the height of the turbine (i.e., within 1,018.5 feet) of State Route 299, any other publicly maintained public highway or street, and of Supan Road or Terry Mill Road. The remaining turbines, infrastructure and other improvements would be the same as proposed for the Project. Due to the increase in setbacks, Alternative 2 would reduce temporary impacts to commercial forest lands by 9 percent, from 1,384 acres to 1,282 acres. Permanent impacts would be reduced by 8 percent, from 713 acres to 664 acres. Therefore, Alternative 2, would result in a slightly reduced impact to Forestry Resources compared to the Project, but the impact conclusion would remain the same: less than significant.

No Project Alternative

If the No Project Alternative is implemented, the Project Site would not be cleared, Project infrastructure would not be constructed and the Project Site would continue to be operated as managed forest timberlands. Harvesting practices and the associated noise, dust, erosion, and traffic that can occur as a result of forest management would continue to occur. Because there would be no change relative to baseline conditions, the No Project Alternative would create no impact related to Forestry Resources.

3.8.4 Cumulative Analysis

The geographic scope considered for the evaluation of cumulative impacts on Forestry Resources is Shasta County. Construction, operation and decommissioning activities are the only phases of the Project expected to impact Forestry Resources. As described in General Plan Section 6.2.2, “[o]ne of Shasta County's most valuable resources is its timberland.” Of the County's 2,428,000 total acres (Shasta County, 2004), 59 percent or 1,454,680 acres are dedicated to commercial forest uses (Shasta County Planning Commission, 2020). From a land use planning perspective, the County’s timberland supply is negatively affected by the conversion of timberland to other land uses that are incompatible with timber operations and management, such as rural residential uses and parcelization into lot sizes that are inefficient for economic timber production (Shasta County, 2004).

The Project would temporarily impact up to 1,384 acres of commercial forest land, harvesting the trees to allow for construction activities. Permanent impacts due to tree removal would be minimal and further reduced due to the proposed plan to replant trees after construction and restore the site as part of decommissioning in coordination with the landowner and in accordance with requirements of the Z’Berg-Nejedly Forest Practice Act, the Forest Practice Rules, and CAL

FIRE's requirements for timber harvesting. Additionally, timber harvesting that would occur within the Project Site for purposes of site preparation and construction would overlap five active or completed THPs, which could result in fewer acres of conversion by the Project than projected for purposes of this analysis (ConnectGen, 2019). The Project would have a relatively small permanent footprint, permanently converting less than 0.06 percent of commercial forest lands or less than 0.03 percent of total timberland Countywide. The Project would not significantly encroach upon forested areas or interfere with the long-term management of resources surrounding the Project Site for the growing and harvesting of timber. The Project would not involve any actions that would directly affect the forestry industry.

Shasta County Code Section 17.08.030(D) allows the construction of "gas, electrical, water, or communication transmission facility, or other public improvements, in accordance with Government Code Section 51152" with the approval of a Use Permit. In accordance with County Code Section 17.64.040, a wind energy system is allowed with approval of a use permit in the Unclassified (U) zoning district as long as it is not otherwise prohibited by law and not inconsistent with the General Plan. The site would be restored during decommissioning and, while Project-related timber conversion would be considered permanent as defined above, the Project Site is expected to be returned to timberland use following the conclusion of the Use Permit term.

Despite past and ongoing conversion of land within Shasta County to uses that are incompatible with timber operations and management, the Project would not significantly contribute to the condition of Forestry Resources. The less-than-significant impact of the Project, considered together with the incremental impacts of other development detailed in Section 3.1.3.1, *Cumulative Scenario*, would not result in a significant impact to Forestry Resources. For example, while development projects potentially including the eleven lot subdivision identified as project #3 in Table 3.1-4, *Potentially Cumulative County Projects*, could result in permanent impacts on Forestry Resources within Shasta County, other projects identified in Table 3.1-4 and Table 3.1-5, *Other Potentially Cumulative Projects within Shasta County*, are sited on land that currently is used for residential, commercial, or other developed purposes and so would not cause or contribute to any significant cumulative effect on Forestry Resources. See, e.g., the amendment to an existing use permit (project #1, Table 3.1-4), and Dignity Health North State Pavilion Project (project #1, Table 3.1-5). Even if the cumulative impacts of all potential projects in the County were significant, the Project's contribution would not be cumulatively considerable due to its *de minimis* contribution to conversion (i.e., permanently converting less than 0.06 percent of commercial forest lands and less than 0.03 percent of total Shasta County timberland).

3.8.5 References

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3.9 Geology and Soils

This section identifies and evaluates issues related to Geology, Soils, and Paleontological Resources in the context of the Project and alternatives. It includes information about the physical and regulatory setting and identifies the criteria used to evaluate the significance of potential impacts, the methods used in evaluating these impacts, and the results of the impact assessment. Paleontological resources would not be impacted by the Project, as described in Section 3.1.4.6 and are therefore not described in this section.

In response to its notice of intention to prepare this Draft EIR, the County received scoping input that landslides and road collapses are not uncommon in the area. Scoping input also identified the presence of Montgomery Creek formations, which are described as "extremely permeable" primarily alluvial fan deposits of sand and mixed rocks, and questioned whether such deposits are suited for the proposed foundations. Comments also suggested that the compaction needed to provide road access throughout the Project Site could alter the current underground water flows to Class 1 streams. Scoping input requested a "full geological investigation" to address the movement of water throughout the geology. Additional comments concerning natural deposits of arsenic that may be present in Project Site soils were also raised; however, no sources of information to support the presence of arsenic were provided and none were identified during follow-up research conducted by the EIR preparers (identified in Chapter 5, *Report Preparation*). All scoping input received, including regarding geology and soils, is provided in Section 4.1 of the Scoping Report, a copy of which is provided in **Appendix J**, *Scoping Report*. No scoping input was received regarding paleontological resources.

3.9.1 Setting

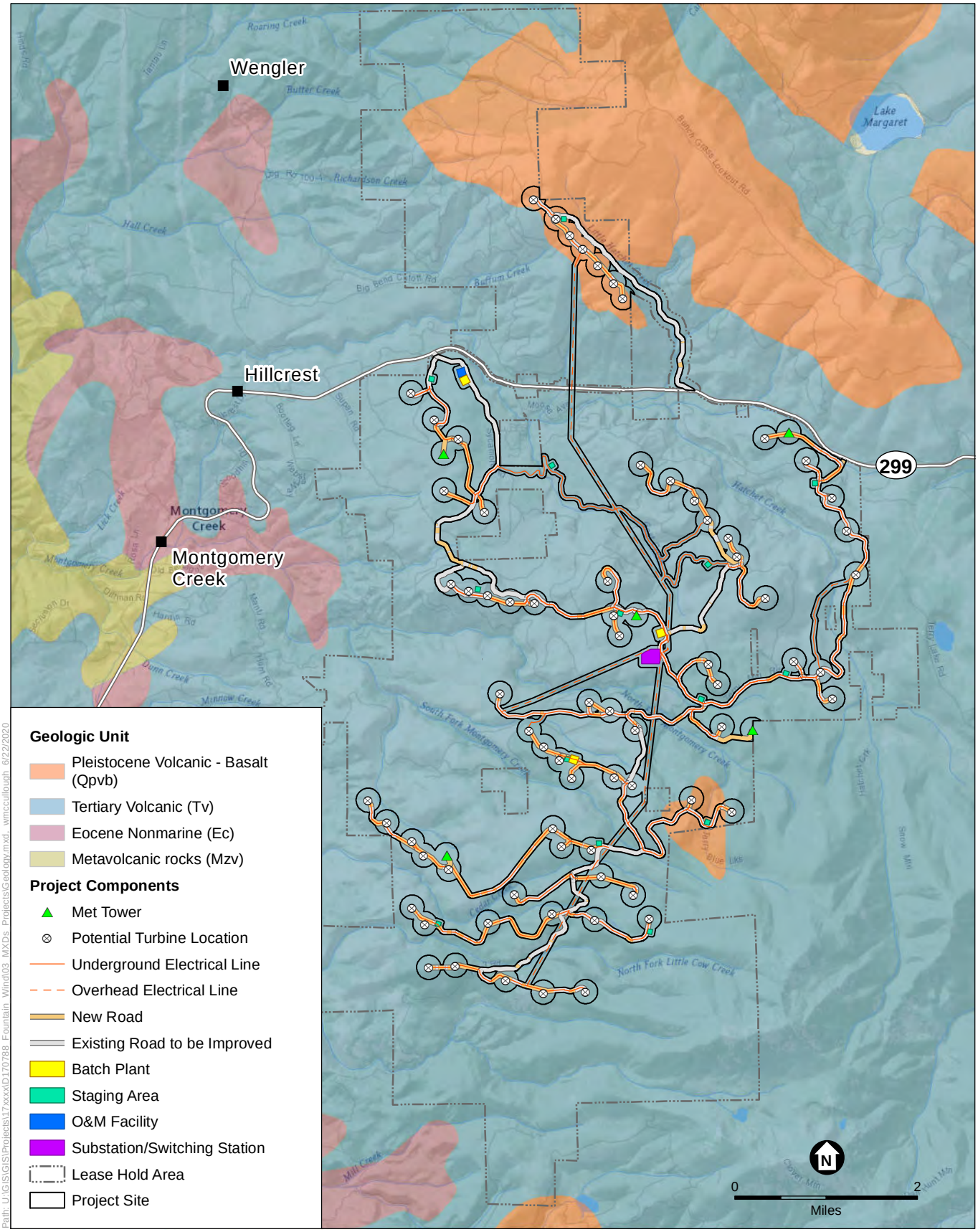
3.9.1.1 Environmental Setting

Regional Geology

The Project Site is located within the Cascade Range Geomorphic Province in eastern Shasta County. The Cascade Range is a chain of volcanic cones extending from Washington to Oregon and into California. Mount Shasta is approximately 35 miles to the northwest of the northern portion of Project Site boundary, and Lassen Peak is approximately 20 miles southeast of the southern portion of the Project Site boundary.

Local Geology

Geologic mapping (depicted in **Figure 3.9-1**, below) by Dupras indicates the Project Site is almost entirely underlain by Pliocene and Pleistocene-age andesitic and basaltic volcanic rocks (Dupras, 1997), originating from volcanic eruptions from Lassen Peak and other volcanic centers of the Cascade Volcanic Arc (Clynne and Muffler, 2017). Mapping by Dupras also indicates outcrops of Eocene-age Montgomery Creek Formation near the central western border of the Project Site boundary.



SOURCE: CGS, 2010

Fountain Wind Project

Figure 3.9-1
Geologic Units

3.9.1.2 Study Area

The study area considered for analysis of geology and soil resources includes the Project Site, which encompasses the temporary and permanent disturbance areas.

Soils

Expansive Soils

Expansive soils are soils that possess a "shrink-swell" characteristic, also referred to as linear extensibility. Shrink-swell is the cyclic change in volume (expansion and contraction) that occurs in fine-grained clay sediments from the process of wetting and drying; the volume change is reported as a percent change for the whole soil. Changes in soil moisture can result from rainfall, landscape irrigation, utility leakage, roof drainage, or perched groundwater.[1] Expansive soils are typically very fine-grained and have a high to very high percentage of clay. Structural damage may occur incrementally over a long period of time, usually as a result of inadequate soil and foundation engineering or the placement of structures directly on expansive soils. Linear extensibility is a geotechnical term used to describe the shrink-swell potential of soils. If the linear extensibility is more than 3 percent, shrinking and swelling may cause damage to building, roads, and other structures. (NRCS, 2018). A majority of the Project Site is underlain by soils with a low expansion potential, with some minor patches of soils with a moderate expansion potential (NRCS, 2019a).

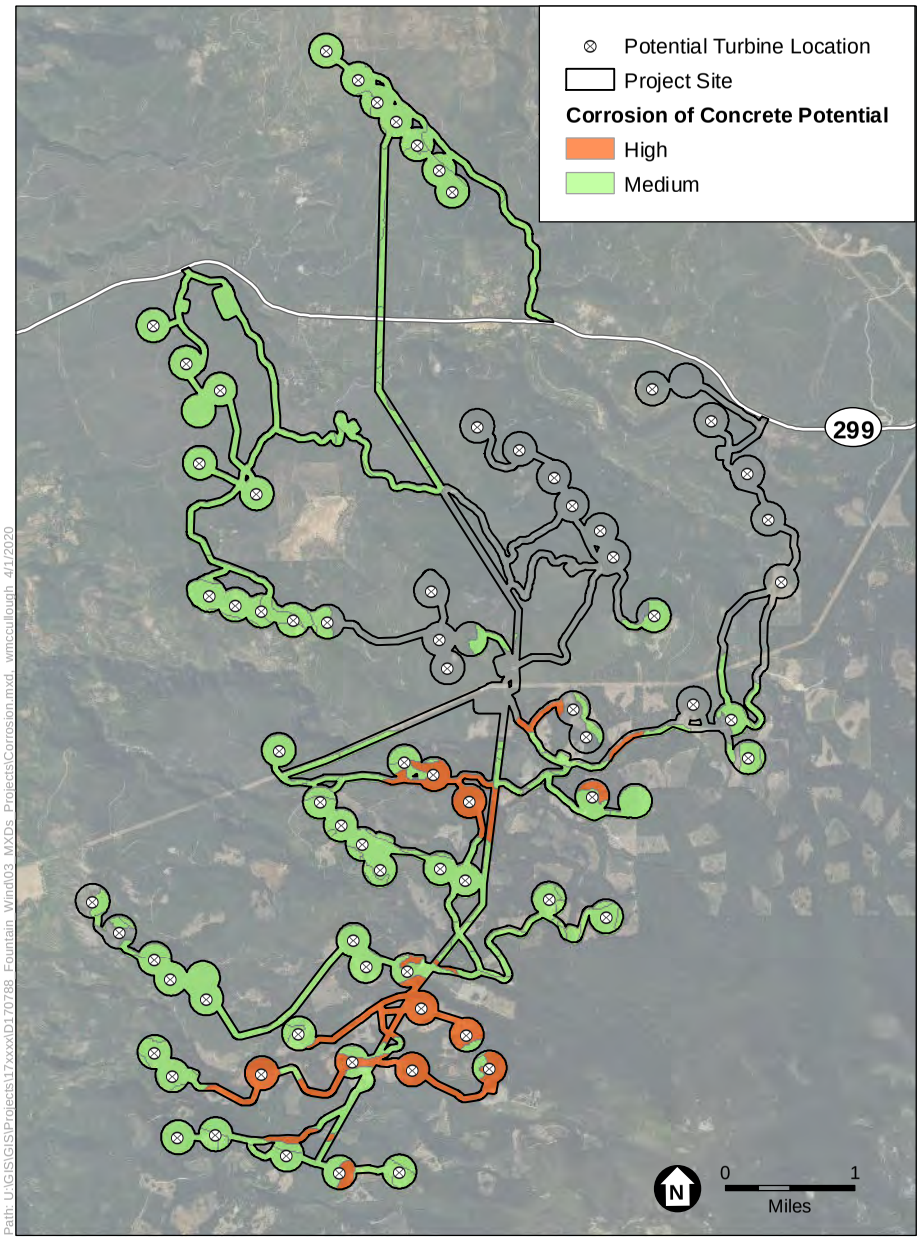
Corrosive Soils

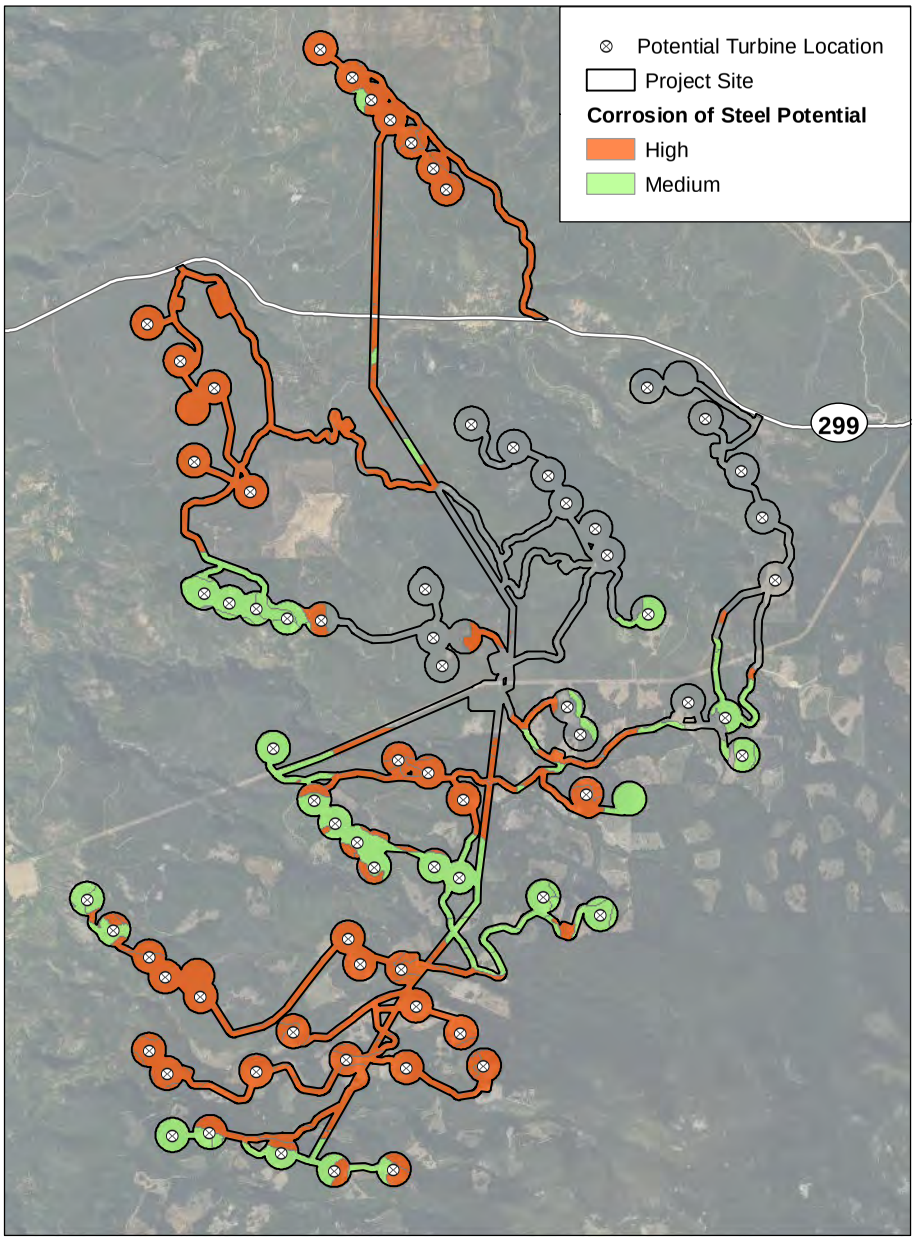
The corrosivity of soils pertains to the potential for certain soils to cause an electrochemical or chemical reaction that can corrode or weaken uncoated steel or concrete. The rate at which these materials corrode is dependent on a number of variables, including but not limited to: soil moisture, texture, mineral content, and acidity. The rate of corrosion of steel is based on soil moisture, particle-size distribution, acidity, and electrical conductivity. Corrosion of concrete is based on the sulfate and sodium content, texture, moisture and acidity of the soil. The risk of corrosion typically is expressed as low, moderate, or high. The NRCS Web Soil Survey provides data assessing the corrosivity of soils, specifically the corrosion of steel and concrete. According to NRCS Web Soil Survey data, the Project Site is underlain by soils that have a range of low, moderate, and high potential to corrode both concrete and steel, depending on the location within the Project Site, as depicted in **Figure 3.9-2**, *Corrosion of Concrete and Steel* (NRCS, 2019b, 2019c). The proposed concrete foundations and steel support structures could be exposed to corrosive soils.

Soils Capable of Supporting the Use of Septic Tanks

Septic tank absorption fields are areas in which effluent from a septic tank system is discharged into the soil through subsurface tiles or perforated pipe. The NRCS Web Soil Survey provides generalized data in terms of a rating class, which indicates the extent to which soils could be limited according to soil series classification. The ratings are based on the soil properties that may affect absorption of the effluent, construction and maintenance of the system, and public

[1] Perched groundwater is a local saturated zone above the water table that typically exists above an impervious layer (such as clay) of limited extent.





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Corrosion of Concrete

Corrosion of Steel

Fountain Wind Project

Figure 3.9-2

Corrosion of Concrete and Steel

ESA

SOURCE: NRCS, 2020

health. Saturated hydraulic conductivity, depth to water table, ponding, depth to bedrock, and flooding affect the absorption of the effluent. Subsidence and excessive slope could also affect septic tank use (NRCS, 2019d).

Soils may be rated either "Not limited," "Somewhat limited," or "Very limited." According to Web Soil Survey data, the soils within the Project Site are considered "Very limited," indicating that the soils have one or more features that are unfavorable for septic tank use (NRCS, 2019d).

Geologic Hazards

Faulting and Seismicity

Regional Faults

The Project Site is not within nor does it intersect an established Alquist-Priolo Earthquake Fault Zone, as mapped by the State Geologist (CGS, 2010). There are no known Holocene-active[2] faults or pre-Holocene[3] faults within the Project Site (CGS, 2010). However, there are a number of fault systems in the region, outside of the Project Site (CGS, 2010). The most significant of these fault systems, considering the proximity to the Project Site, are the Hatchet Ridge Fault Zone, the Rocky Ledge Fault Zone and the Hat Creek Fault Zone. Of these, the Rocky Ledge and Hat Creek fault zones have been designated "Earthquake Fault Zones" by the State Geologist, meaning there is evidence of displacement sometime in the last 11,700 years and they are considered active (CGS, 1990, 1991). The Rocky Ledge Fault Zone and the Hat Creek Fault Zone are located approximately 8.5 miles and 15 miles to the northeast of eastern border of the Project Site boundary, respectively. The Hatchet Ridge Fault Zone, although not considered active (because there is no evidence for displacement in the last 11,700 years), is the nearest fault zone to the Project Site. It is located approximately 2 miles to the east of the eastern most border of the Project Site boundary. See **Figure 3.9-3**, *Regional Faults.*

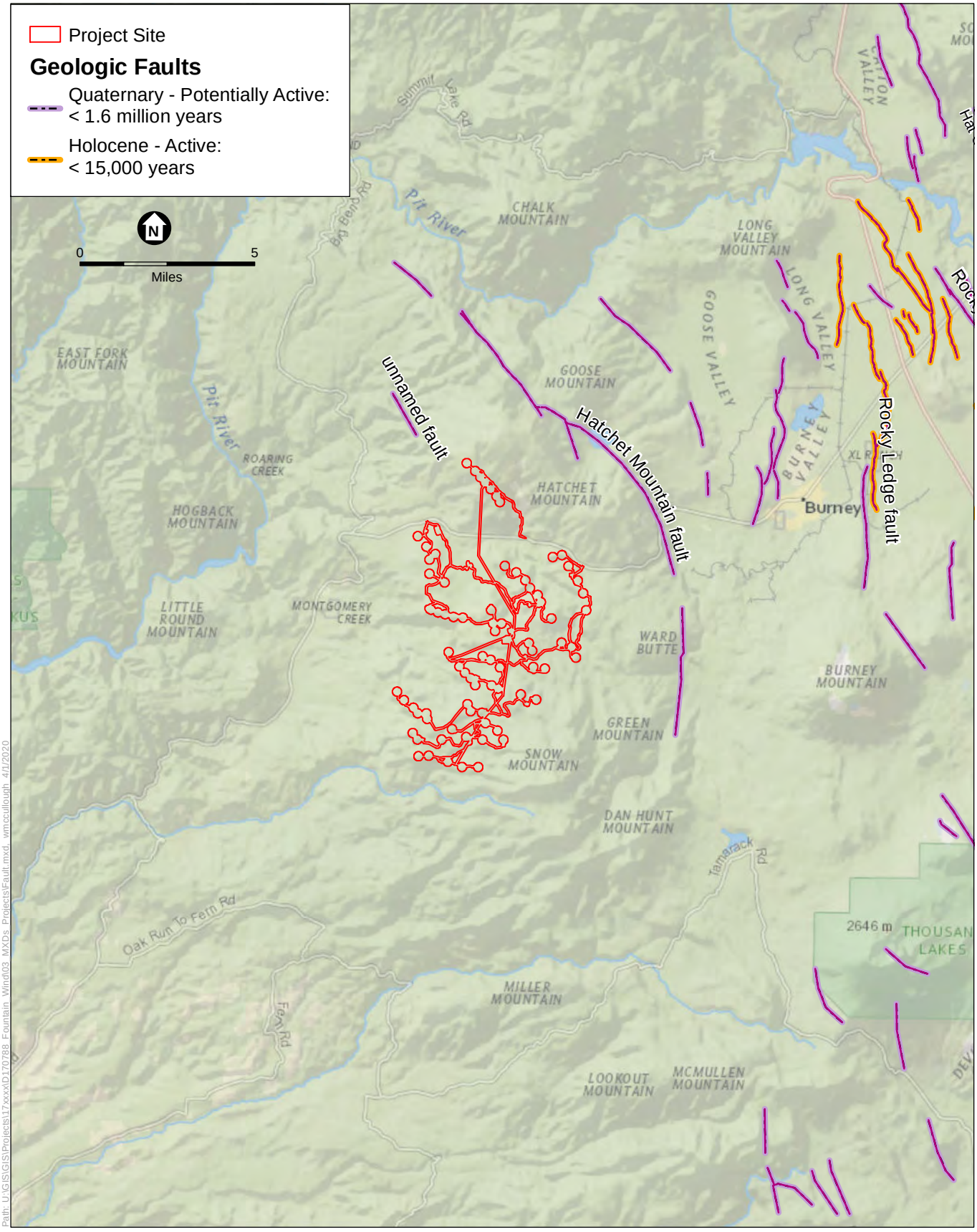
Seismic Ground Shaking

Ground shaking occurs due to a seismic event and can cause extensive damage to life and property, and may affect areas hundreds of miles away from the earthquake's epicenter. The extent of the damage varies by event and is determined by several factors, including (but not limited to): magnitude and depth of the earthquake, distance from epicenter, duration and intensity of the shaking, underlying soil and rock types, and integrity of structures.

While Shasta County has a low level of historic seismic activity (Shasta County, 2018), the entire Northern California region, including the Project Site, could be subject to strong ground shaking during earthquakes. The 2014 Working Group on California Earthquake Probabilities concluded that there is a 95 percent probability that a magnitude (M_W) 6.7 earthquake or higher will strike somewhere in Northern California by the year 2045 (Field et al., 2015).

[2] Faults that have evidence of displacement within the Holocene Epoch, or the last 11,700 years are considered active (CGS, 2018).

[3] Faults that have **not** shown evidence of displacement in the last 11,700 years (CGS, 2018).



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SOURCE: USGS, 2010

Oakland Waterfront Ballpark District Project

Figure 3.9-3
Regional Faults

ShakeMap is a product of the USGS Earthquake Hazards Program; ShakeMap earthquake scenarios represent one realization of a potential future earthquake by assuming a particular magnitude and location (USGS, 2020). According to the ShakeMap that corresponds with an earthquake planning scenario generated by an estimated 7.2 M_W earthquake on the Hat Creek Fault Zone, the Project Site would be subjected to moderate to strong seismic ground shaking (USGS, 2016). While there is no ShakeMap earthquake scenario generated for the Rocky Ledge Fault Zone, it is assumed that an earthquake of equal or greater magnitude to the Hat Creek Fault Zone scenario would produce groundshaking of equal or greater magnitude.

Seismicity Related to Volcanic Activity Associated with Lassen Peak

Lassen Peak is considered an active volcano in the Cascade Range with historic activity, and is included as part of the Lassen Volcanic Center. Lassen Volcanic Center last erupted during 1914 through 1917, with the largest event occurring in May of 1915 (CGS, 2018). There are seven volcanoes in California that are considered by the USGS and CGS as having a high to very high threat potential.

There is currently no method for predicting when volcanic eruptions will occur, though increased seismicity and ground deformation are often the first indication of a potential eruption in volcanically active areas. Increased seismicity may provide the earliest indication that a volcanic system is being recharged, and that the system could be evolving toward an eruption (Clynne et al., 2012).

While volcanic eruptions are not analyzed under CEQA, the increased seismicity that is associated with Lassen Volcanic Center could contribute to strong seismic groundshaking at the Project Site, as well as other geologic hazards that can occur as a result of seismic groundshaking (i.e., liquefaction and landslides).

Liquefaction

Liquefaction is a phenomenon in which unconsolidated, water saturated sediments become unstable due to the effects of strong seismic shaking. During an earthquake, these sediments can behave like a liquid, potentially causing severe damage to overlying structures. Lateral spreading is a variety of minor landslide that occurs when unconsolidated liquefiable material breaks and spreads due to the effects of gravity, usually down gentle slopes. Liquefaction-induced lateral spreading is defined as the finite, lateral displacement of gently sloping ground as a result of pore-pressure buildup or liquefaction in a shallow underlying deposit during an earthquake. The occurrence of this phenomenon is dependent on many complex factors, including the intensity and duration of ground shaking, particle-size distribution, and density of the soil.

The potential damaging effects of liquefaction include differential settlement, loss of ground support for foundations, ground cracking, heaving and cracking of structure slabs due to sand boiling, and buckling of deep foundations due to ground settlement. Dynamic settlement (i.e., pronounced consolidation and settlement from seismic shaking) may also occur in loose, dry sands above the water table, resulting in settlement of and possible damage to overlying structures. In general, a relatively high potential for liquefaction exists in loose, sandy soils that are within 50 feet

of the ground surface and are saturated (below the groundwater table). Lateral spreading can move blocks of soil, placing strain on buried pipelines that can lead to leaks or pipe failure.

The Shasta County General Plan identifies the South Central Region of Shasta County as an area of potential liquefaction (Shasta County, 2018). The Project Site would not be located in the South Central Region on the County. As discussed above, the underlying geology within the Project Site is entirely volcanic and not composed of loose, sandy deposits. According to the Water Supply Assessment by Stantec (see **Appendix I**), the depth to groundwater in 29 of the 33 wells located within 1 mile of SR 299 is highly variable and ranges between 5 and 238.5 feet below ground surface.

Landslides

Landslides are one of the various types of downslope movements in which rock, soil, and other debris are displaced due to the effects of gravity. The potential for material to detach and move down slope depends on a variety of factors including the type of material, water content, steepness of terrain, and more. The CGS has not mapped the Project Site region for susceptibility to landslide risks under the Seismic Hazards Mapping Act (Public Resources Code §2690 et seq.).

The Shasta County General Plan, however, mentions that landslides are known to occur throughout the County, and are especially prevalent in its northern and eastern areas. Although landslides are known to occur throughout the County, seismically-induced landslides are not considered a significant hazard in Shasta County (Shasta County, 2004).

According to geologic mapping by Dupras, there are no landslide deposits mapped within the Project Site (Dupras, 1997). According to topographic maps of the United States Geological Survey (USGS), the Project Site includes relatively steep slopes (USGS, 2018a, 2018b) where landslides, debris flows, or rock falls could occur.

3.9.1.3 Regulatory Setting

Federal

Occupational Safety and Health Administration

The Occupational Safety and Health Act requires employers to comply with safety and health standards promulgated by the Occupational Safety and Health Administration (OSHA). OSHA Excavation standards, which are set forth in Title 29 Code of Federal Regulations (CFR) Part 1926, Subpart P, contain requirements for excavation and trenching operations.

State

The Z'Berg-Nejedly Forest Practice Act of 1973 (Pub. Res. Code §4511-4360.2) and its implementing regulations, the Forest Practice Rules (14 Cal. Code Regs. §895 et seq.), govern the management of privately owned forestlands in California, including requisite erosion controls, such as drainage facilities, soil stabilization treatments, road and landing abandonment, removal and treatment of watercourse crossings, and any other features or actions to reduce surface erosion, gullying, channel erosion, and mass erosion. See, for example:

- Rule 915.1, 935.1, 955.1, which establishes performance standards for the use of heavy equipment for site preparation, including that such equipment "shall not be used for site preparation under saturated soil conditions that may produce significant sediment discharge; or when it cannot operate under its own power due to wet conditions" (14 Cal. Code Regs. §§915.1, 935.1, 955.1[b]).
- Rule 916.7, 936.7, 956.7, which establishes performance standards for the reduction of soil loss (14 Cal. Code Regs. §§916.7, 936.7, 956.7).
- Rule 3706(d), which establishes the following performance standard for drainage, diversion structures, waterways, and erosion control: "Surface runoff and drainage from surface mining activities shall be controlled by berms, silt fences, sediment ponds, revegetation, hay bales, or other erosion control measures, to ensure that surrounding land and water resources are protected from erosion, gullying, sedimentation and contamination. Erosion control methods shall be designed to handle runoff from not less than the 20 year/1-hour intensity storm event" (14 Cal. Code Regs. §3706[d]).

The California Board of Forestry and Fire Protection provides additional guidance in its 2013 Road Rules and Technical Addendum No. 5: Guidance on hydrologic disconnection, road drainage, minimization of diversion potential and high risk crossings (CAL FIRE, 2013).

Alquist-Priolo Earthquake Fault Zoning Act

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. In accordance with this act, the State Geologist established regulatory zones, called "earthquake fault zones," around the surface traces of active faults and published maps showing these zones. Within these zones, buildings for human occupancy cannot be constructed across the surface trace of active faults. Each earthquake fault zone extends approximately 200 to 500 feet on either side of the mapped fault trace, because many active faults are complex and consist of more than one branch. There is the potential for ground surface rupture along any of the branches. Currently, there are no earthquake fault zones that are mapped as intersecting or adjacent to the Project Site.

California Building Code

The California Building Code (CBC), codified in Title 24 of the California Code of Regulations Part 2, was promulgated to safeguard the public health, safety, and general welfare by establishing minimum standards for structural strength, means of ingress/egress to facilities (entering and exiting), and general stability of buildings. The purpose of the CBC is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction.

The CBC is administered by the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable. The provisions of the CBC apply to the construction, alteration, movement, replacement, location, and demolition of every building or structure or any appurtenances connected or attached to such buildings or structures throughout California.

The 2019 edition of the CBC is based on the 2018 International Building Code published by the International Code Council, which replaced the Uniform Building Code. The code is updated triennially; the 2019 edition of the CBC was published by the California Building Standards Commission on July 1, 2019, and went into effect on January 1, 2020. The 2019 CBC contains California amendments based on the American Society of Civil Engineers (ASCE) Minimum Design Standard ASCE/SEI 7-16, Minimum Design Loads for Buildings and Other Structures. The CBC provides requirements for general structural design and includes means for determining earthquake loads, as well as other loads (such as wind loads), for inclusion in building codes.

CBC Chapter 18 covers the requirements of geotechnical investigations (Section 1803), excavation, grading, and fills (Section 1804), load bearing of soils (Section 1806) and foundations (Section 1808), shallow foundations (Section 1809), and deep foundations (Section 1810).

Requirements for geotechnical investigations are included in Appendix J, CBC Section J104, Engineered Grading Requirements. As outlined in Section J104, applications for a grading permit must be accompanied by plans, specifications, and supporting data consisting of a soils engineering report and engineering geology report. Additional requirements for subdivisions requiring tentative and final maps and for other specified types of structures are in Health and Safety Code Sections 17953–17955 and in 2019 CBC Section 1802. Samples from subsurface investigations, such as from borings or test pits, must undergo testing. Studies must be done as needed to evaluate slope stability, soil strength, position and adequacy of load-bearing soils, the effect of moisture variation on load-bearing capacity, compressibility, liquefaction, differential settlement, and expansiveness.

The design of the proposed buildings, structures and infrastructure would be required to comply with CBC requirements.

California Occupational Safety and Health Administration

Occupational safety standards exist in federal and state laws to minimize worker safety risks from both physical and chemical hazards in the workplace. In California, the California Division of Occupational Safety and Health (Cal/OSHA) and the federal Occupational Safety and Health Administration (OSHA) are the agencies responsible for ensuring worker safety in the workplace.

The OSHA Excavation and Trenching standard (29 CFR §1926.650) covers requirements for excavation and trenching operations. OSHA requires protecting all excavations in which employees could potentially be exposed to cave-ins, by sloping or benching the sides of the excavation, supporting the sides of the excavation, or placing a shield between the side of the excavation and the work area. Cal/OSHA also regulates dust protection during construction and the issues around fugitive dust is discussed more fully in Section 3.3, *Air Quality*. Cal/OSHA is the implementing agency for both federal and state OSHA standards. All contractors must comply with OSHA regulations, which would make the Project consistent with OSHA.

National Pollutant Discharge Elimination System Construction General Permit

Construction of the Project would disturb more than 1 acre of land surface, potentially affecting the quality of stormwater discharges into waters of the United States. The Project therefore would

be subject to the National Pollutant Discharge Elimination System (NPDES) *General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities* (Order 2009-0009-DWQ, NPDES No. CAS000002, Construction General Permit; as amended by Orders 2010-0014-DWQ and 2012-006-DWQ).

The Construction General Permit regulates discharges of pollutants in stormwater associated with construction activity to waters of the United States from construction sites that disturb one or more acres of land surface, or that are part of a common plan of development or sale that disturbs more than one acre of land surface. The permit regulates stormwater discharges from construction or demolition activities, such as clearing and excavation; construction of buildings; and linear underground projects, including installation of water pipelines and other utility lines.

The Construction General Permit requires that construction sites be assigned a risk level of 1 (low), 2 (medium), or 3 (high), based both on the sediment transport risk at the site and the risk to receiving waters during periods of soil exposure (e.g., grading and site stabilization). The sediment risk level reflects the relative amount of sediment that could be discharged to receiving water bodies, and is based on the nature of the construction activities and the location of the site relative to receiving water bodies. The receiving-waters risk level reflects the risk to receiving waters from the sediment discharge. Depending on the risk level, construction projects governed by the Construction General Permit could be subject to the following requirements:

- Effluent standards
- Good site management "housekeeping"
- Non-stormwater management
- Erosion and sediment controls
- Run-on and runoff controls
- Inspection, maintenance, and repair
- Monitoring and reporting requirements

The Construction General Permit requires the development and implementation of a Storm Water Pollution Prevention Plan (SWPPP) that includes specific best management practices (BMPs) designed to prevent sediment and pollutants from coming into contact with stormwater and moving off-site into receiving waters. The BMPs fall into several categories, including erosion control, sediment control, waste management, and good housekeeping. They are intended to protect surface water quality by preventing eroded soil and construction-related pollutants from migrating off-site from the construction area. Routine inspection of all BMPs is required under the Construction General Permit. In addition, the SWPPP must contain a visual monitoring program, a chemical monitoring program for non-visible pollutants, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment. See Section 3.12.1.3, *Regulatory Setting,* for details about the 303(d) list.

The SWPPP must be prepared before construction begins. The SWPPP must contain a site map(s) that delineates the construction work area, existing and proposed buildings, parcel boundaries, roadways, stormwater collection and discharge points, general topography both before and after construction, and drainage patterns across the project area. The SWPPP must list BMPs and the placement of those BMPs that the applicant would use to protect stormwater runoff.

Examples of typical construction BMPs include scheduling or limiting certain activities to dry periods, installing sediment barriers such as silt fence and fiber rolls, and maintaining equipment and vehicles used for construction. Non-stormwater management measures include installing specific discharge controls during certain activities, such as paving operations, and washing and fueling of vehicles and equipment. The Construction General Permit also sets post-construction standards (i.e., implementation of BMPs to reduce pollutants in stormwater discharges from the site after construction).

Seismic Hazards Mapping Act

The Seismic Hazards Mapping Act was passed in 1990 following the Loma Prieta earthquake to reduce threats to public health and safety and to minimize property damage caused by earthquakes. This act requires the State Geologist to delineate various seismic hazard zones, and cities, counties, and other local permitting agencies to regulate certain development projects within these zones. For projects that would locate structures for human occupancy within designated Zones of Required Investigation, the Seismic Hazards Mapping Act requires project applicants to perform a site-specific geotechnical investigation to identify the potential site-specific seismic hazards and corrective measures, as appropriate, prior to receiving building permits. The *CGS Guidelines for Evaluating and Mitigating Seismic Hazards* (Special Publication 117A) provides guidance for evaluating and mitigating seismic hazards (CGS, 2008). The CGS is in the process of producing official maps based on USGS topographic quadrangles, as required by the Act. However, no mapping of the region that includes the Project Site has been compiled by the CGS.

Local

Shasta County General Plan

Section 5.1, *Seismic and Geological Hazards,* of the Shasta County General Plan describes the following objectives and policies regarding seismic and geological hazards that are related to the Project (Shasta County, 2004).

Objectives:

***SG-1*:** Protection of all development from seismic hazards by developing standards for the location of development relative to these hazards; and protection of essential or critical structures, such as schools, public meeting facilities, emergency services, high-rise and high-density structures, by developing standards appropriate for such protection.

***SG-2*:** Protection of development on unstable slopes by developing standards for the location of development relative to these hazards.

***SG-3*:** Protection of development from other geologic hazards, such as volcanoes, erosion, and expansive soils.

***SG-4*:** Protection of waterways from adverse water quality impacts caused by development on highly erodible soils.

Policies:

SG-a: Development proposals for critical or high density structures, as defined in the Uniform Building Code, located within a half mile of any fault identified as an Earthquake Fault Zone by the California Division of Mines and Geology shall include a geologic study of potential fault rupture. Geologic studies which are undertaken shall be performed by a registered geologist according to general guidelines of the California Division of Mines and Geology. Proposals for critical structures, as defined in the Uniform Building Code, within the study area shall include a site-specific seismic hazards evaluation, including ground motion criteria for the design of new buildings and structures.

SG-b: In order to minimize development that would be endangered by landslides, geological investigations by a registered geologist or a geological engineer will be required on all subdivision and/or developments where the preliminary staff report indicates the possibility of landslides on or adjacent to the development. A landslide map shall be developed and maintained as these reports are accumulated for reference by the development sponsors.

SG-c: Shasta County shall coordinate with State and Federal agencies monitoring volcanic activity and shall periodically review and update the Shasta County Emergency Plan with respect to volcanic hazards.

SG-d: Shasta County shall develop and maintain standards for erosion and sediment control plans for new land use development. Special attention shall be given to erosion prone hillside areas, including those with extremely erodible soils types such as those evolved from decomposed granite.

SG-e: When soil tests reveal the presence of expansive soils, engineering design measures designed to eliminate or mitigate their impacts shall be employed.

SG-f: Shasta County shall pursue preparation of development standards based on topography and soil erosion potential in revising its land capability standards pursuant to Policy CO-h.

SG-g: Shasta County should comply with the requirements of the Seismic Hazards Mapping Act, when the Seismic Hazards Maps for the County are completed and made available by the State Geologist. The Maps will include liquefaction hazard zones and earthquake-induced landslide hazard zones.

3.9.2 Significance Criteria

CEQA Guidelines Appendix G Section VII identifies considerations relating to geology and soils resources. See Section 3.1.4, *Environmental Considerations Unaffected by the Project or Not Present in the Project Area*, as it relates to the County's analysis of the potential impacts of this Project to the considerations suggested in CEQA Guidelines Appendix G Section VII. Otherwise, for purposes of this analysis, a project would result in a significant impact to Geology and Soils Resources if it would:

a) Directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving:

   i. Strong seismic ground shaking;

ii. Seismic-related ground failure, including liquefaction; or

iii. Landslides

b) Result in substantial soil erosion or the loss of topsoil;

c) Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse;

d) Be located on expansive soil, as defined in California Building Code (2019) Section 1803.5.3[4], creating substantial direct or indirect risks to life or property; or

e) Have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

3.9.3 Direct and Indirect Effects

3.9.3.1 Methodology

The following impact analysis is based on the Project characteristics and publicly available information on site conditions including geologic mapping. The analysis also considers the current regulatory requirements that would apply to the proposed improvements.

3.9.3.2 Direct and Indirect Effects of the Project

a.i) Whether the Project would directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking.

Impact 3.9-1: The Project could directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving strong seismic ground shaking. (*Less-than-Significant Impact*)

Strong seismic ground shaking could occur at the Project Site because there are active fault zones within 15 miles of the Project Site as well as potential seismic events related to volcanic activity. As discussed in the CBC subsection identified in Section 3.9.1.3, *Regulatory Setting*, a preliminary and final, Project-specific, site-specific, design-level geotechnical investigation and accompanying report would be required prior to construction. The geotechnical investigation that would result from compliance with this independently enforceable legal requirement would provide seismic design requirements consistent with the most updated version of the CBC. These seismic design requirements would be based on site–specific, Project-specific data, would be implemented during construction, and would significantly reduce the potential for damage to structures caused in the event of strong seismic ground shaking.

[4] Note that Appendix G refers to Table 18-1-B of the 1994 Uniform Building Code. The Uniform Building Code is no longer the basis for the California Building Code which is now based on the 2018 International Building Code. Because the considerations in CEQA Guidelines Appendix G are advisory rather than compulsory, the preparers of this EIR have elected to rely on the 2018 International Building Code, which provides the basis for State law.

Compliance with CBC requirements, including recommendations provided by a final design level geotechnical report, would ensure impacts related to strong seismic groundshaking, would be less than significant.

Mitigation: None required.

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a.ii) Whether the Project would directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction.

Impact 3.9-2: The Project could directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving seismic-related ground failure, including liquefaction. (*Less-than-Significant Impact*)

While the Project Site may be subject to strong seismic groundshaking in the event of an earthquake in the area, there is a general low risk of liquefaction according to the Shasta County General Plan and geologic mapping (Shasta County, 2004; Dupras, 1997). The Project Site is underlain primarily by volcanic deposits (not generally susceptible to liquefaction) and the groundwater level being relatively deep (greater than 50 feet deep), the potential for liquefaction or other ground failure is unlikely.

However, liquefaction hazards can only really be determined based on site-specific data. The required design-level geotechnical investigation identified above would analyze conditions within the Project Site where improvements are proposed, and would identify any potential for liquefaction or other seismic-related ground failure as required by the CBC. Should any potential liquefaction hazards be identified, the final design-level geotechnical report would provide seismic design requirements consistent with the most updated version of the CBC, which would be implemented during construction to significantly reduce the potential for any damage to structures caused by seismic-related ground failures, including liquefaction.

Compliance with CBC requirements, including recommendations provided by a geotechnical report, would ensure impacts related to ground failure, including liquefaction, would be less than significant.

Mitigation: None required.

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a.iii) Whether the Project would directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides.

Impact 3.9-3: The Project could directly or indirectly cause potential substantial adverse effects, including the risk of loss, injury, or death involving landslides. (*Less-than-Significant Impact*)

Although landslides are known to occur in throughout Shasta County, seismically-induced landslides are not considered a significant hazard pursuant to the General Plan (Shasta County,

2004). Geologic mapping by Dupras (Dupras, 1997) indicates there are no landslide deposits located within the Project Site. However, as described in Section 3.9.1.2, *Environmental Setting*, the Project Site includes relatively steep slopes where landslides, debris flows, or rock falls could occur.

However, required site-specific, design-level geotechnical investigation identified above would analyze site-specific conditions, including any potential for landslide potential or other slope instability in accordance with CBC requirements. Should any potential impact be identified, the resulting report would provide seismic design requirements consistent with the most updated version of the CBC, which would be implemented during construction and decommissioning to significantly reduce the potential for any damage to structures that may be caused by landslides.

Compliance with CBC requirements, including recommendations provided by the requisite Project-specific, site-specific design-level geotechnical report, would ensure impacts related to landslides would be less than significant.

Mitigation: None required.

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b) Whether the Project would result in substantial soil erosion or the loss of topsoil.

Impact 3.9-4: The Project could result in substantial soil erosion or the loss of topsoil. (*Less-than-Significant Impact*)

The Project would include ground-disturbing activities during construction, operation and decommissioning that could increase the risk of erosion or sediment transport, if not managed appropriately. As mentioned in the introduction to this section, scoping input inquired about the possible presence of natural arsenic within Project Site soils: arsenic and the potential for it to contaminate groundwater is discussed in Section 3.11, *Hazards and Hazardous Materials*. Otherwise, ground-disturbing activities could result in soil erosion during excavation, grading, trenching, and soil stockpiling. Because such activities would exceed 1 acre during construction and decommissioning, the Project would be required to comply with the Construction General Permit described in Section 3.9.1.3, *Regulatory Setting*, and discussed further in Section 3.12, *Hydrology and Water Quality*. This state requirement was developed to ensure that stormwater is managed to protect water quality and includes erosion control measures for construction sites as well as post construction requirements. The Construction General Permit requires preparation and implementation of a SWPPP, which requires applying BMPs to control run-on and runoff from construction work sites. The BMPs would include but not be limited to physical barriers to prevent erosion and sedimentation; construction of sedimentation basins; limitations on work periods during storm events; use of infiltration swales; protection of stockpiled materials; and a variety of other measures that would substantially reduce or prevent erosion from occurring during construction. Through compliance with these independently enforceable existing requirements, the potential impacts of the Project associated with soil erosion and loss of topsoil during construction, operation, and decommissioning would be less than significant.

As discussed in Section 2.4.5, *Site Preparation and Construction*, existing commercial and pre-commercial timber would be harvested, treated, and/or removed from the Project Site prior to construction. Soil erosion could occur as a result of timber clearance and harvesting activities. Prior to any clearing and harvesting activities the Project would be required to comply with a Timber Harvesting Plan (THP). The THP would specify the location of timber to be harvested, how it would be harvested, and environmental BMPs that would be implemented during harvesting. The BMPs would include practices to protect water quality (by regulating soil erosion) during timber harvesting. In addition, as discussed above in the Regulatory Setting, the timber harvest activities would be required to adhere to the Z'Berg-Nejedly Forest Practice Act of 1973 (Pub. Res. Code §§4511–4360.2) and its implementing regulations, the Forest Practice Rules (14 Cal. Code Regs. §895 et seq.). Compliance would include implementing erosion controls, such as drainage facilities, soil stabilization treatments, road and landing abandonment, removal and treatment of watercourse crossings, and any other features or actions to reduce surface erosion, gullying, channel erosion, and mass erosion. Typically, implementation of erosion control measures during the timber removal activities followed by prompt soil stabilization treatments have proven effective in minimizing erosion and the loss of topsoil. Therefore, timber harvesting would have a less-than-significant impact related to erosion and loss of topsoil.

Activities that would occur during the Project's operation and maintenance period also could increase the risk of erosion or sediment transport if not managed appropriately. Such activities could include, for example, on-site use of utility vehicles, cranes, and other equipment to maintain rotors or other major wind turbine components as well as periodic grading or compaction of permanent access roads to minimize erosion, and the cleaning of catch basins, roadway ditches, and culverts. If not managed properly, these activities could increase the risk of erosion and sediment transport, and could create a significant impact.

Implementation of the required SWPPP and adherence to the requisite BMPs during the construction, and operations and maintenance phases, as well as the BMPs included in the THP during timber clearance and harvesting, the impacts related to soil erosion and loss of topsoil would be less than significant.

Mitigation: None required.

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c) Whether the Project would be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse.

Impact 3.9-5: The Project could be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the Project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse. (*Less-than-Significant Impact*)

As discussed previously, the impact of the Project related to liquefaction, landslide, or other ground failure would be less than significant. While the potential for liquefaction, landslides, or

other ground failures is low, the required geotechnical investigation would analyze the site-specific conditions within the Project Site where foundations, footings and other infrastructure would be located as identified in final designs, and would identify any potential for geologic hazards to adversely affect proposed improvements. Should any potential hazards be identified, the geotechnical report would provide specific measures to address relevant site preparation, design or other requirements consistent with the most updated version of the CBC. These would be implemented during construction and decommissioning to significantly reduce the potential for any damage to structures.

Compliance with CBC requirements, including recommendations provided by a geotechnical report, would ensure impacts related to liquefaction, landslides, or other ground failures would be less than significant.

Mitigation: None required.

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d) Whether the Project would be located on expansive or corrosive soil, as defined in California Building Code (2019) Section 1803.5.3, creating substantial direct or indirect risks to life or property.

Impact 3.9-6: The Project could be located on expansive or corrosive soil, as defined in California Building Code Section 1803.5.3, creating substantial direct or indirect risks to life or property. (*Less-than-Significant Impact*)

***Expansive Soil*:** According to the NRCS Web Soil Survey data described in Section 3.9.1.2, *Environmental Setting*, a majority of the soil underlying the Project Site has a low expansion potential, with minor areas of moderate expansion potential. The potential impacts to life or property associated with expansive soils could be significant if not addressed appropriately. The Project design and construction activities would be required to comply with CBC regulations and requirements and would employ standard engineering and building practices common to construction projects throughout California (e.g., soil removal and replacement with engineered soil) that are also consistent with building code requirements.

The required design-level geotechnical investigation described above would identify any expansive soils within the Project Site and specific responsive requirements to ensure that all foundations and other below-ground infrastructure would not be adversely affected by expansive soils. Adherence to design requirements consistent with the most updated version of the CBC and site-specific geotechnical report would ensure that the impact of the Project related to expansive soils would be less than significant.

***Corrosive Soil*:** NRCS Web Soil Survey mapping (Figure 3.9-1, *Potentially Corrosive Soils*) shows a majority of the Project Site as underlain by soils that have a range of potential to corrode both steel and concrete. Because Project components include steel support structures and concrete foundations, these structures could be in contact with potentially corrosive soils. The impacts to life or property associated with corrosive soils, if not addressed appropriately, would be

significant due to the soils corroding and/or weakening the concrete and/or steel followed by subsequent failure of the affected infrastructure.

The required design-level geotechnical investigation described above would identify any corrosive soils that could be affected by Project infrastructure pursuant to the final design, and would impose site-specific design and soil amendment requirements, if necessary, to ensure that all foundations and other below-ground improvements would not be impacted by corrosive soils. Adherence to design requirements consistent with the most updated version of the CBC and the site-specific, final design-level geotechnical report would ensure that the impact of the Project related to corrosive soils would be less than significant.

Mitigation: None required.

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e) Whether the Project would have soils incapable of adequately supporting the use of septic tanks or alternative waste water disposal systems where sewers are not available for the disposal of waste water.

Impact 3.9-7: The Project could have soils incapable of adequately supporting the use of a septic tank. (*Less-than-Significant Impact*)

No alternative waste water disposal systems are proposed for disposal of waste water. As discussed in Section 2.4.4.3, *Operation and Maintenance Facility*, the O&M facility would be served by an onsite septic system for the disposal of wastewater. As discussed in Section 3.9.1.2, *Study Area*, the soils within the Project Site are rated as "Very limited" in relation to septic tank usage according to the generalized NRCS Web Soil Survey data. Actual performance of the soils in the vicinity of the O&M facility would be dependent on site-specific characteristics. If the system is not designed appropriately, onsite soils could be incapable of disposing the anticipated volumes of wastewater.

Prior to installation, a septic system permit would be required by the Shasta County Department of Resource Management's Environmental Health Division. Adherence to requirements of the septic system permit would include site-specific soil testing and percolation tests to ensure the onsite septic system would be installed properly and within adequate soils that meet minimum County standards. As a result, the Project would not introduce an environmental or public health hazard by building septic tanks or other wastewater disposal system in soils that are incapable of adequately supporting such systems. A less-than-significant impact would result.

Mitigation: None required.

3.9.3.3 PG&E Interconnection Infrastructure

The Project would connect into the existing PG&E 230 kV line via an aboveground line tap located directly adjacent to the switching station. Minor modifications or upgrades to the existing 230 kV line may be required to facilitate the Project's interconnection. Upgrades to PG&E

facilities are anticipated to include construction and/or reconfiguration of utility line structures and transmission line circuits involving four to six new transmission poles. Geologic, seismic, and soil hazards and impacts discussed above would be the same for this portion of the site; therefore, all less-than-significant impact conclusions described above are applicable and would be the same for the Interconnection Infrastructure.

3.9.3.4 Direct and Indirect Effects of Alternatives

Alternative 1: South of SR 299

Under Alternative 1, no turbines would be erected north of SR 299. The elements of Alternative 1 would be required to comply with CBC regulations and stormwater permitting regulations governing erosion control. Because a septic system would be constructed, operated and maintained and ultimately decommissioned, the same County and other requirements as described for the Project also would apply to Alternative 1. Therefore, impacts associated with seismic groundshaking, seismic related ground failures, erosion and expansive and corrosive soils, and the suitability of Project Site soils to support a septic system would be less than significant for the same reasons as described for the Project.

Alternative 2: Increased Setbacks

Under Alternative 2, there would be fewer turbines reducing overall temporary (construction-related) and permanent disturbance. The elements of Alternative 2 would be required to comply with CBC regulations and stormwater permitting regulations governing erosion control. Because a septic system would be constructed, operated and maintained and ultimately decommissioned, the same County and other requirements as described for the Project also would apply to Alternative 2. Therefore, impacts associated with seismic groundshaking, seismic related ground failures, erosion and expansive and corrosive soils, and the suitability of Project Site soils to support a septic system would be less than significant for the same reasons as described for the Project.

No Project Alternative

If the No Project Alternative is implemented, none of the proposed wind turbines, turbine foundations, or other associated infrastructure (including the proposed septic system), facilities, or structures would be constructed, operated and maintained, or decommissioned on the Project Site. The proposed overhead and underground electrical collector system and communications lines would not be developed; and the meteorological towers, onsite collector substation, switching station, and operation and maintenance (O&M) facility would not be constructed. Laydown areas would not be cleared, no new access roads would be constructed, and no existing roads would be improved. None of the proposed belowground disturbance would occur, and the Project Site would continue to be operated as managed forest timberlands. Because there would be no change relative to baseline conditions, the No Project Alternative would create no impact related to Geology and Soils.

The Project Site is zoned for timber production. Pursuant to regulations implementing the California Timberland Productivity Act (Government Code §51100 et seq.; 14 Cal. Code Regs. §897[a]), there is a legal presumption that "timber harvesting is expected to and will occur on such lands." The regulations further specify that timber harvesting on such lands "shall not be presumed to have a Significant Adverse Impact on the Environment" (14 Cal. Code Regs. §898). Therefore, the No Project Alternative, including anticipated timber harvesting, is not presumed to result in a significant adverse individual or cumulative effect to Geology or Soils. CAL FIRE would review any future timber harvesting proposal to evaluate any potential project-specific, site-specific environmental impacts.

3.9.4 Cumulative Analysis

Impacts related to geology, soils, and seismicity tend to be site-specific and depend on the local geology and soil conditions. For these reasons, the geographic scope for potential cumulative impacts consists of the Project Site. The Project could contribute to a cumulative impact on geology, soils, and seismicity if the effects of the Project overlapped in time and space with those of other projects in the area, producing similar effects. Significant cumulative impacts related to geology and soils could occur if the incremental impacts of the Project combined with the incremental impacts of one or more of the cumulative projects described in Section 3.1.2.1, *Cumulative Scenario*, would cause substantial adverse effects involving geologic, seismic, or soil hazards.

The NPDES Construction General Permit would require each cumulative project involving disturbance of 1 acre or more of land to prepare and implement a SWPPP. The SWPPPs would describe BMPs to control runoff and prevent erosion for each such project. Through compliance with this requirement, the potential for erosion impacts would be reduced for all cumulative projects. The Construction General Permit has been developed to address cumulative conditions arising from construction throughout the state, and is intended to maintain cumulative effects of projects subject to this requirement below levels that would be considered significant. For example, two adjacent construction sites would be required to implement BMPs to reduce and control the release of sediment and/or other pollutants in any runoff leaving their respective sites. The runoff water from both sites would be required to achieve the same action levels, measured as a maximum amount of sediment or pollutant allowed per unit volume of runoff water. Thus, even if the runoff waters were to combine after leaving the sites, the sediments and/or pollutants in the combined runoff would still be at concentrations (amount of sediment or pollutants per volume of runoff water) below action levels and would not combine to be cumulatively significant.

Soil erosion and sedimentation would occur during timber clearance and harvesting, and these impact would be the same for any other possible timber harvesting or clearance associated with other potential projects. Any other projects including timber harvest and clearance would be required to prepare a project THP and would be subject to the same BMPs requirements within that

THP, which would further reduce any cumulative impact related to erosion and sedimentation. (Less than Significant)

Seismically-induced ground shaking, liquefaction and lateral spreading, and expansive or corrosive soils could cause structural damage or pipeline leaks or ruptures during construction and operations phases. However, state and local building regulations and standards have been established to address and reduce the potential for such impacts to occur. The Project and cumulative projects would be required to comply with applicable provisions of these laws and regulations. Through compliance with these requirements, the potential for impacts would be reduced. The purpose of the CBC (and related local ordinances) is to regulate and control the design, construction, quality of materials, use/occupancy, location, and maintenance of all buildings and structures within its jurisdiction; by design, it is intended to reduce the cumulative risks from buildings and structures. Based on compliance with these requirements, the incremental impacts of the Project combined with impacts of other projects in the area would not cause a significant cumulative impact related to seismically induced ground shaking, liquefaction and lateral spreading, or expansive or corrosive soils. (Less than Significant)

3.9.5 References

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3.10 Greenhouse Gas Emissions

This section identifies and evaluates issues related to greenhouse gas (GHG) emissions in the context of the Project and alternatives. It includes information about the physical and regulatory setting and identifies the criteria used to evaluate the significance of potential impacts, the methods used in evaluating the impacts, and the results of the impact assessment. The information and analysis presented in this section rely on the modeling results presented in **Appendix B**, *Air Quality and Greenhouse Gas Emissions*.

In response to its notice of intention to prepare this Draft EIR, the County received scoping input about annual rainfall assumptions, annual average wind speed, and concerns that operation of the proposed wind turbines could result in "localized atmospheric warming" (also referred to as a "heat island effect") that would affect the snow pack and temperatures required to grow apples on property near the Project Site. The possibility also was raised that the wind turbulence of turbines located along ridge lines could impact local weather by disrupting normal air flow over ridge tops, that spinning turbine rotors increase the vertical mixing of heat and water vapor, thereby affecting downwind meteorological conditions, including rainfall.

Multiple scoping comments requested disclosure of the Project's net effect on GHGs, including any reduction of other green sources of energy production (such as local hydroelectric capacity that would have to be throttled back during the operation of the proposed turbines) and any reduction in the site's GHG sequestration capacity caused by the temporary and permanent removal of forested acres. All scoping input received, including regarding GHG emissions and climate change, is provided in Section 4.1 of the Scoping Report, a copy of which is provided in **Appendix J**, *Scoping Report*.

Scoping comments also requested that the EIR provide a "cradle-to-grave" carbon life cycle analysis that factors in emissions associated with the mining, manufacture, transportation, and construction of turbines, concrete, rebar, and other materials for the Project. CEQA does not require the suggested depth of inquiry (OPR, 2017), and it is not provided here.

The California Natural Resources Agency (CNRA) has indicated that in the context of GHG emissions, (1) there exists no standard regulatory definition for "life cycle"; and (2) even if a standard definition for life cycle existed, the term might be interpreted to refer to emissions beyond those that could be considered "indirect effects" as defined by the CEQA Guidelines, and therefore, beyond what an EIR is required to estimate and mitigate (CNRA, 2009).

This reasoning was reaffirmed in Section 15126.2(b) of the November 2018 CEQA Guidelines, which cautions that the analysis of impacts is subject to the rule of reason, and must focus on energy demand (and associated GHG emissions) caused by the project, signaling that a full "life cycle" analysis that would account for energy used by industrial facilities in building materials and consumer projects generally is not be required (CNRA, 2018a).

3.10.1 Setting

3.10.1.1 Study Area

The geographic scope of impacts related to GHG emissions is global. This analysis focuses on the impacts from the Project's emissions associated with potential conflicts with California's GHG reduction targets set forth in Senate Bill (SB) 32 and SB 100, and the Project's direct and/or indirect generation of GHG emissions.

3.10.1.2 Environmental Setting

Greenhouse Gases

The principal GHGs are carbon dioxide (CO_2), methane (CH_4), nitrous oxide (N_2O), sulfur hexafluoride (SF_6), perfluorocarbons (PFCs), and hydrofluorocarbons (HFCs). Every GHG has its own global warming potential (GWP), which is a measurement of how much heat the GHG can trap within the atmosphere and how much of an environmental impact it is expected to have. GWPs determine the ratio of heat trapped by one unit mass of the specific GHG to that of one unit mass of CO_2 over a specified time period. The GWP factors were developed by the International Panel on Climate Change (IPCC), a United Nations–established scientific organization.

CO_2 is the most common reference gas for climate change. To account for the warming potential of different GHGs, GHG emissions often are quantified and reported as CO_2 equivalents (CO_2e). For example, SF_6 is a GHG commonly used in the utility industry as an insulating gas in circuit breakers and other electronic equipment. SF_6, while comprising a small fraction of the total GHGs emitted annually world-wide, is a much more potent GHG with 22,800 times the global warming potential as CO_2, which has a global warming potential of 1.[1] Large emission sources are reported in million metric tons of CO_2e.[2]

Impacts of Climate Change

Climate change refers to any significant change in measures of climate (such as temperature, precipitation, or wind) lasting for an extended period (decades or longer). The scientific community's understanding of the fundamental processes responsible for global climate change has improved over the past decade, and its predictive capabilities are advancing. However, there remain significant scientific uncertainties in, for example, predictions of local effects of climate change, occurrence, frequency, and magnitude of extreme weather events, effects of aerosols, changes in clouds, shifts in the intensity and distribution of precipitation, and changes in oceanic circulation. Due to the complexity of the Earth's climate system and inability to accurately model it, the uncertainty surrounding the localized effects of climate change may never be completely eliminated.

[1] The California Emissions Estimator Model (CalEEMod) is the modeling software used chiefly for determining GHG emissions from CEQA projects. CalEEMod currently utilizes the global warming potentials from the Intergovernmental Panel on Climate Change (IPCC) Fourth Assessment Report (AR4).

[2] The term metric ton is commonly used in the U.S. to refer to the metric system unit, tonne, which is defined as a mass equal to 1,000 kilograms. A metric ton is approximately 1.1 short tons and approximately 2,204.6 pounds.

The *Fourth California Climate Change Assessment* (Fourth Assessment), published in 2018, found that the potential impacts in California due to global climate change include: loss in snow pack; sea level rise; more extreme heat days per year; more high ozone days; more extreme forest fires; more severe droughts punctuated by extreme precipitation events; increased erosion of California's coastlines and seawater intrusion into the Sacramento–San Joaquin Delta and associated levee systems; and increased pest infestation (OPR et al., 2018).

Surface temperature is projected to rise over the 21st century under all assessed emission scenarios. It is very likely that heat waves will occur more often and last longer, and that extreme precipitation events will become more intense and frequent in many regions. The expectation is that the ocean will continue to warm and acidify, and global mean sea level will rise. Continued human-based generation of GHGs will likely cause further warming and long-lasting changes in all components of the climate system, increasing the likelihood of severe, pervasive, and irreversible impacts for people and ecosystems. Limiting climate change would require substantial and sustained reductions in GHG emissions which, together with adaptation, can limit climate change risks (IPCC, 2014).

Temperature Increase. The primary effect of adding GHGs to the atmosphere has been a rise in the average global temperature. The impact of human activities on global temperature is readily apparent in the observational record. While year-to-year variations occur due to natural variability, 2019 was 2.19°F above a pre-industrial baseline (1881–1910) temperature, and the five warmest years have occurred over the past 5-year period (Climate Central, 2020). In 2019, the average annual temperature for the contiguous U.S. was 52.7°F, 0.7°F above the 20th Century average, ranking in the warmest third of the 125-year record (NOAA, 2020). The Fourth Assessment indicates that average temperatures in California could rise 5.6°F to 8.8°F by the end of the century, depending on the global trajectory of GHG emissions (OPR et al, 2018).

Wildfires. The hotter and dryer conditions expected with climate change will make forests more susceptible to extreme wildfires. A recent study found that, if GHG emissions continue to rise, the frequency of extreme wildfires burning over approximately 25,000 acres would increase by nearly 50 percent, and the average area burned statewide each year would increase by 77 percent, by the year 2100.

Air Quality. Higher temperatures, conducive to air pollution formation, could worsen air quality in California and make it more difficult for the state to achieve air quality standards. Climate change may increase the concentration of ground-level ozone in particular, which can cause breathing problems, aggravate lung diseases such as asthma, emphysema, and chronic bronchitis, and cause chronic obstructive pulmonary disease (COPD). Emissions from wildfires can lead to excessive levels of particulate matter, ozone, and volatile organic compounds (Kenward et al., 2013).

Hydrology and Sea Level Rise. California's hydrology is already changing due to global climate shifts. The vulnerability of the water sector to climate change stems from a modified hydrology that affects the frequency, magnitude, and duration of extreme events, which in turn, affect water quantity, quality, and infrastructure. Changes in hydrology include declining snowpack, earlier snow melt, more precipitation as rain than snow, more frequent and longer droughts, more frequent and more severe flooding, changes in the timing and volume of peak runoff, and

consequent impacts on water quality and water availability. Additionally, rising sea levels will produce higher storm surges during coastal storms.

Sea levels measured at stations in San Francisco have risen at a rate of 8 inches over the century. Sea level rise in California could lead to flooding of low-lying areas, loss of coastal wetlands such as portions of the San Francisco Bay-Delta system, erosion of cliffs and beaches, saltwater contamination of drinking water, impacts on roads and bridges, and harmful ecological effects along the coastline (CNRA, 2018b).

Agriculture. Successful food crop production is closely tied to weather, which reflects the conditions of the atmosphere over a short period of time. Climate change is changing the longer-term patterns of atmospheric conditions, and the resulting impacts are expected to worsen over the next century. Climate impacts like unpredictable water availability, rising minimum and maximum temperatures, extended heat waves, changes in the prevalence of plant and livestock pests and diseases, and impacts to beneficial species directly affect agricultural food crop and livestock production. This poses a significant threat to California farms, which grow over 33 percent of the vegetables and two-thirds of the fruits and nuts in the U.S. (CNRA, 2018b).

Ecosystem and Biodiversity Impacts. Climate change impacts on ecosystems and biodiversity are being observed in alteration of the timing of critical biological events such as spring bud burst and substantial range shifts of many species. In the longer term, there is an increased risk of species extinction. Events such as droughts, floods, wildfires, and pest outbreaks associated with climate change can also disrupt ecosystems (Melillo et al., 2014).

Human Health Impacts. Global climate change also is anticipated to result in more extreme heat events (OPR et al., 2018). These extreme heat events increase the risk of death from dehydration, heart attack, stroke, and respiratory distress, especially with people who are ill, children, the elderly, and the poor, who may lack access to air conditioning and medical assistance. A warming planet is expected to bring more severe weather events, worsening wildfires and droughts, a decline in air quality, rising sea levels, increases in allergens and in vector-borne diseases, all of which present significant health and wellbeing risks for California populations (CNRA, 2018b).

Greenhouse Gas Emissions Estimates

Global Emissions

Total global annual GHG emissions, including from land-use change, reached a record high of 55.3 gigatons (Gt) CO_2e in 2018, an increase of 3.4 Gt CO_2e compared with 2017. GHG emissions have risen at a rate of 1.5 percent per year in the last decade, stabilizing only briefly between 2014 and 2016 (UN Environment, 2019).

U.S. Emissions

In 2018, the United States emitted about 6.68 billion tons of CO_2e, representing a 2.9 percent increase from 2017. The increase in total GHG emissions between 2017 and 2018 was driven largely driven by an increase in CO_2 emissions from fossil fuel combustion. CO_2 accounts for approximately 82 percent of GHG emissions. The increase in CO_2 emissions from fossil fuel

combustion was a result of multiple factors, including increased energy consumption from greater heating and cooling needs due to a colder winter and hotter summer in 2018 (in comparison to 2017).

Of the five major sectors nationwide—residential and commercial, industry, agriculture, transportation, and electricity—transportation accounts for the highest fraction of GHG emissions (approximately 28 percent), closely followed by the electric power industry (approximately 27 percent), and general industry (approximately 22 percent). Total emissions from the electric power sector have decreased by 3.4 percent since 1990, and the carbon intensity of the electric power sector has decreased by 13 percent during that same time frame. Between 1990 and 2018, renewable energy generation (in kilowatt-hours) from solar and wind energy have increased from 0.1 percent in 1990 to 8 percent of total electricity generation in 2018, which helped drive the decrease in the carbon intensity of the electricity supply in the U.S. (USEPA, 2020).

State of California Emissions

In 2017, California emitted approximately 424 million tons of CO_2e, representing a 1.2 percent decrease from 2016. For the first time since California started to track GHG emissions, electricity generation from zero-GHG sources, including solar, hydroelectric, wind, and nuclear, exceeded generation from GHG-emitting sources. The transportation sector remains the largest source of GHG emissions in the State and saw a one percent increase in emissions in 2017; however, this represents the lowest growth rate for this sector over the past 4 years.

The latest California Air Resources Board (CARB) inventory also reports that transportation is the source of approximately 41 percent of the state's GHG emissions, followed by industrial sources at 24 percent, and electricity generation (both in-state and out-of-state) at 15 percent. Emissions from the electricity sector showed another large (9 percent) reduction in emissions in 2017 from approximately 68.3 to 62.3 million tons of CO_2e due to a large increase in renewable energy. Residential and commercial activity is the source of about 12 percent of California's GHG emissions and agriculture is the source of approximately 8 percent of California's GHG emissions (CARB, 2019).

Shasta County Emissions

Shasta County completed a baseline GHG emissions inventory as a part of its regional climate action planning process. In 2008, Shasta County generated a total of approximately 4.48 million metric tons of CO_2e (MT CO_2e) emissions. Stationary sources (e.g., cement plants, lumber mills, biomass generation facilities) were the highest source of emissions countywide contributing approximately 54 percent of the total emissions, followed by transportation emissions (19 percent) and energy-related emissions (14 percent). When agriculture, forestry, and stationary source emissions are removed, as the County does not have authority to influence these activities, the 2008 countywide jurisdictional inventory was reduced to 1.76 million MT CO_2e. In the jurisdictional-only inventory, transportation emissions contributed approximately 48 percent of total emissions and energy-related emissions were approximately 37 percent.

In 2008, the unincorporated areas of Shasta County, where the Project Site is located, generated a total of approximately 3.13 million MT CO_2e, with the stationary sources being the largest source of emissions at 72 percent of total emissions, followed by transportation (8 percent), energy (7 percent), forestry (5 percent), and agriculture emissions (4 percent). When the agriculture, forestry, and stationary source sectors are removed in the jurisdictional inventory, baseline emissions dropped considerably to approximately 0.57 million MT CO_2e. In the jurisdictional-only inventory, the transportation and energy sectors were the largest emissions sources at 43 percent and 36 percent, respectively (Shasta County, 2012).

3.10.1.3 Regulatory Setting

Federal

U.S. Environmental Protection Agency "Endangerment" and "Cause or Contribute" Findings

GHGs fit within the Clean Air Act's definition of a pollutant and are regulated by the USEPA. On December 7, 2009, the USEPA Administrator signed two findings regarding GHGs under Section 202(a) of the federal Clean Air Act:

- **Endangerment Finding:** The current and projected concentrations of six key GHGs (CO_2, CH_4, N_2O, HFCs, PFCs, and SF_6) in the atmosphere threaten the public health and welfare of current and future generations.
- **Cause or Contribute Finding:** The combined emissions of these GHGs from new motor vehicles and new motor vehicle engines contribute to the GHG pollution that threatens public health and welfare.

Mandatory Greenhouse Gas Reporting Rule

On September 22, 2009, the USEPA released its final Greenhouse Gas Reporting Rule (Reporting Rule). The Reporting Rule is a response to the fiscal year (FY) 2008 Consolidated Appropriations Act (H.R. 2764; Public Law 110-161), that required the USEPA to develop "…mandatory reporting of GHGs above appropriate thresholds in all sectors of the economy." The Reporting Rule applies to most entities that emit 25,000 metric tons of CO_2e or more per year. The Project would not reach this threshold.

Greenhouse Gas Emissions and Corporate Average Fuel Economy Standards

In 2014 the USEPA and the Department of Transportation's National Highway Traffic Safety Administration (NHTSA) established a program that reduces GHG emissions and improves fuel economy for all new cars and trucks sold in the U.S. The program required manufacturers to build a fleet that meets all federal and State requirements with an end target fuel economy of 54.5 miles per gallon by model year 2025. In January 2017, USEPA issued its Mid-Term Evaluation of the GHG emissions standards, finding that it would be practical and feasible for automakers to meet the model year 2022 to 2025 standards through a number of existing technologies.

In August 2018, the USEPA revised its 2017 determination, and issued a proposed rule that maintains the 2020 Corporate Average Fuel Economy (CAFE) and CO_2 standards for model years

2021 through 2026 (83 Fed. Reg. 42986). The estimated CAFE and CO_2 standards for model year 2020 are 43.7 miles per gallon (mpg) and 204 grams of CO_2 per mile for passenger cars and 31.3 mpg and 284 grams of CO_2 per mile for light trucks, projecting an overall industry average of 37 mpg, as compared to 46.7 mpg under the standards issued in 2012. On May 1, 2018, California, joined by 16 other states and the District of Columbia, filed a petition challenging the USEPA's proposed rule to revise the vehicle emissions standards, arguing that the USEPA had reached erroneous conclusions about the feasibility of meeting the existing standards. On October 25, 2019, the D.C. Circuit dismissed the challenges, concluding that it did not have jurisdiction to consider the US EPA's withdrawal of the Obama administration's mid-term determination that model year 2022 to 2025 GHG emission standards promulgated in 2012 remained appropriate. The court noted that the withdrawal did not itself change the emission standards established in 2012 but only created the possibility that the standards could be modified in the future, similar to an agency's grant of a petition for reconsideration of a rule.[3] Accordingly, due to the uncertainty of future federal regulations, this analysis assumes that the existing CAFE standards will remain in place.

State

Executive Order S-3-05

In 2005, in recognition of California's vulnerability to the effects of climate change and information from the IPCC, Governor Arnold Schwarzenegger issued Executive Order S-3-05 (EO S-3-05), which announced goals for statewide GHG emission reductions and target dates by which those goals should be met. These included a reduction of GHG emissions to 2000 levels by 2010; a reduction of GHG emissions to 1990 levels by 2020; and a reduction of GHG emissions to 80 percent below 1990 levels by 2050.

As discussed below, the 2020 reduction target was codified in 2006 as Assembly Bill 32. However, the 2050 reduction target has not been codified and the California Supreme Court has ruled that CEQA lead agencies are not required to use it as a significance threshold. *Cleveland National Forest Foundation v. San Diego Association of Governments* (2017) 3 Cal.5th 497.

Assembly Bill 32 and the California Climate Change Scoping Plan

In 2006, the California Legislature enacted Assembly Bill 32 (Health and Safety Code §38500 et seq., or AB 32), also known as the Global Warming Solutions Act. AB 32 required CARB to design and implement feasible and cost-effective emission limits, regulations, and other measures, such that statewide GHG emissions are reduced to 1990 levels (i.e., 427 million metric tons CO_2e) by 2020 (representing a 25 percent reduction in emissions). AB 32 anticipated that the GHG reduction goals will be met, in part, through local government actions.

Pursuant to AB 32, CARB adopted a Scoping Plan in December 2008 (CARB, 2009), which was re-approved by CARB on August 24, 2011, that outlines measures to meet the 2020 GHG reduction target. To meet this target, California had to reduce its GHG emissions by 30 percent below projected 2020 business-as-usual emissions levels or about 15 percent from 2008 levels.

[3] The State of California's May 1, 2018 petition, the October 25, 2019 decision by the U.S. Court of Appeals for the D.C. Circuit, and other materials in the docket for Case No. 18-1114 are available online: http://climatecasechart.com/case/california-v-epa-4. Accessed December 10, 2019.

The Scoping Plan recommended measures for further study and possible State implementation, such as new fuel regulations. It estimated that a reduction of 174 million metric tons of CO_2e (about 191 million U.S. tons) from the transportation, energy, agriculture, and forestry sectors and other sources could be achieved should the State implement all of the measures in the Scoping Plan. CARB noted that successful GHG emission reductions would rely in part on local governments' land use planning and urban growth decisions, as addressed by SB 375, discussed below. The AB 32 emissions reduction target was achieved in 2017, 3 years prior to the 2020 goal.

The Scoping Plan is required by AB 32 to be updated at least every 5 years. The most recent scoping plan update, the 2017 Scoping Plan Update, was adopted on December 14, 2017. It addressed the 2030 target established by SB 32, as discussed below, and established a proposed framework of action for California to meet a 40 percent reduction in GHG emissions by 2030 compared to 1990 levels. The key programs that the Scoping Plan Update builds on include increasing the use of renewable energy in the state, the Cap-and-Trade Regulation, the Low Carbon Fuel Standard, and reduction of methane emissions from agricultural and other wastes (CARB, 2017).

Executive Order B-30-15 and Senate Bill 32

California Executive Order B-30-15 (April 29, 2015) set an "interim" statewide emission target to reduce GHG emissions to 40 percent below 1990 levels by 2030, and directed State agencies with jurisdiction over GHG emissions to implement measures pursuant to statutory authority to achieve this 2030 target. Specifically, the Executive Order directed CARB to update the Scoping Plan to express this 2030 target in metric tons. On September 8, 2016, Governor Jerry Brown signed SB 32, which codified the 2030 reduction target called for in Executive Order B-30-15. CARB's 2017 Scoping Plan update addressed the 2030 target, as discussed above (CARB, 2017).

Senate Bill 605

On September 21, 2014, Governor Jerry Brown signed SB 605, which required CARB to complete a comprehensive strategy to reduce emissions of short-lived climate pollutants in the state no later than January 1, 2016. As defined in the statute, short-lived climate pollutant means "an agent that has a relatively short lifetime in the atmosphere, from a few days to a few decades, and a warming influence on the climate that is more potent than that of carbon dioxide." SB 605, however, does not prescribe specific compounds as short-lived climate pollutants or add to the list of GHGs regulated under AB 32. In developing the strategy, CARB completed an inventory of sources and emissions of short-lived climate pollutants in the state based on available data, identified research needs to address any data gaps, identified existing and potential new control measures to reduce emissions, and prioritized the development of new measures for short-lived climate pollutants that offer co-benefits by improving water quality or reducing other air pollutants that impact community health and benefit disadvantaged communities.

Senate Bill 375

In addition to policy directly guided by AB 32, the California Legislature in 2008 enacted SB 375, which provides for regional coordination in land use and transportation planning and funding to help meet the AB 32 GHG reduction goals. SB 375 aligns regional transportation

planning efforts, regional GHG emissions reduction targets for light duty vehicles, and land use assumptions in General Plans, and housing allocations. SB 375 requires Regional Transportation Plans (RTPs) developed by the state's 18 metropolitan planning organizations (MPOs) to incorporate sustainable communities strategies (SCS) that will achieve GHG emission reduction targets set by CARB and coordinate regional housing and transportation. Shasta Regional Transportation Agency (SRTA) is the federally recognized metropolitan planning organization (MPO) for the Shasta County region.

The *2018 Regional Transportation Plan & Sustainable Communities Strategy for the Shasta Region* was adopted by the SRTA Board of Directors on October 9, 2018 (SRTA, 2018a). The RTP/SCS lays out how the region will meet certain GHG reduction targets. Pursuant to SB 375, CARB established emission reduction targets for California's 18 MPO regions for the years 2020 and 2035. Shasta County was assigned a zero percent per capita change for its two targets when compared to the 2005 baseline year. The 2018 RTP meets these targets as a result of integrated land use, housing, and transportation planning. The SCS features seven Strategic Growth Areas (SGAs) where various strategies are focused to reduce per capita vehicle miles traveled and associated GHG emissions. Strategies are intended to increase population and employment density within SGAs and to provide a range of practical mobility alternatives.

On March 22, 2018, CARB revised the Shasta Region's reduction target to four percent for both 2020 and 2035. However, these revised targets will apply to the 2022 RTP update cycle (SRTA, 2018a).

Senate Bill 1368

SB 1368 (Chapter 598, Statutes of 2006) is the companion bill of AB 32 and was signed by Governor Schwarzenegger in September 2006. SB 1368 requires the California Public Utilities Commission (CPUC) to establish a GHG emissions performance standard for baseload generation from investor-owned utilities by February 1, 2007. The California Energy Commission (CEC) also was required to establish a similar standard for local publicly owned utilities by June 30, 2007. These standards cannot exceed the GHG emission rate from a baseload combined-cycle natural gas-fired plant. The legislation further requires that all electricity provided to California, including imported electricity, must be generated from plants that meet the standards set by the CPUC and CEC. The Project, as a renewable energy generation facility, complies with the GHG EPS requirements of SB 1368.

Renewables Portfolio Standards

The State of California adopted standards to increase the percentage that retail sellers of electricity, including investor-owned utilities and community choice aggregators, must provide from renewable resources. The standards are referred to as the Renewables Portfolio Standards (RPS). Qualifying renewables under the RPS include bioenergy such as biogas and biomass, small hydroelectric facilities 30 megawatt (MW) or less, wind, solar, and geothermal energy. The CPUC and the CEC jointly implement the RPS program. The CPUC's responsibilities include: (1) determining annual procurement targets and enforcing compliance; (2) reviewing and approving each investor-owned utility's renewable energy procurement plan; (3) reviewing

contracts for RPS-eligible energy; and (4) establishing the standard terms and conditions used in contracts for eligible renewable energy (CPUC, 2020).

Senate Bill 350

SB 350, known as the Clean Energy and Pollution Reduction Act of 2015, was enacted on October 7, 2015, and provides a new set of objectives in clean energy, clean air, and pollution reduction by 2030. The objectives include the following:

1. Increase the procurement of the state's electricity from renewable sources from 33 percent to 50 percent by December 31, 2030.
2. Double the energy efficiency savings in electricity and natural gas for final end uses of retail customers through energy efficiency and conservation.

Senate Bill 100

On September 10, 2018, Governor Brown signed SB 100, establishing that 100 percent of all electricity in California must be obtained from renewable and zero-carbon energy resources by December 31, 2045. SB 100 also creates new standards for the RPS goals that were established by SB 350 in 2015. Specifically, the bill increases required energy from renewable sources for both investor-owned and publicly owned utilities from 50 percent to 60 percent by 2030. Incrementally, these energy providers are also required to have a renewable energy supply of 33 percent by 2020, 44 percent by 2024, and 52 percent by 2027. The updated RPS goals are considered achievable, since many California energy providers are already meeting or exceeding the RPS goals established by SB 350.

On the same day that SB 100 was signed, Governor Brown signed Executive Order B-55-18 with a new statewide goal to achieve carbon neutrality (zero-net GHG emissions) by 2045 and to maintain net negative emissions thereafter.

Forest Carbon Plan

In 2018, the Forest Climate Action Team, made up of California agencies including the California Natural Resources Agency, the California Environmental Protection Agency, and the California Department of Forestry, and Fire Protection (CAL FIRE), prepared the Forest Carbon Plan. The Forest Carbon Plan describes forest conditions across California and provides a projection of future conditions given the ongoing and expected impacts of climate change. The plan also describes goals and related specific actions to improve overall forest health, enhance carbon storage resilience, increase sequestration, and reduce GHG emissions, and provides principles and policies to guide and support those actions. A key finding of the plan is that reducing carbon losses from forests, particularly the extensive carbon losses that occur during and after extreme wildfires in forests and through uncharacteristic tree mortality, is essential to meeting the State's long-term climate goals (Forest Climate Action Team, 2018).

17 Cal. Code Regs. Section 95350 et seq.

The purpose of this regulation is to achieve GHG emission reductions by reducing SF_6 emissions from gas-insulated switchgear. Owners of such switchgear must not exceed maximum allowable

annual emissions rates, which are reduced each year until 2020, after which annual emissions must not exceed 1.0 percent. Owners must regularly inventory gas-insulated switchgear equipment, measure quantities of SF_6, and maintain the applicable records for at least 3 years. Additionally, by June 1st each year, owners must submit an annual report to CARB's Executive Officer for emissions that occurred during the previous calendar year.

Local

Shasta Regional Climate Action Plan

In 2010, the Shasta County Air Quality Management District (AQMD) initiated the regional climate action planning (RCAP) process. The primary objectives of the RCAP process are to contribute to the State's climate protection efforts and includes emission reduction measures. Chapter 2 of the RCAP serves as the Climate Action Plan (CAP) for the unincorporated areas within the County, including the Project Site.

Unincorporated Shasta County's GHG reduction targets are as follows:

1. Reduce community emissions to 15 percent below 2008 levels by 2020 (i.e., 485,567 MT CO_2e/yr).
2. Reduce community emissions to 49 percent below 2008 levels by 2035 (i.e., 291,340 MT CO_2e/yr).
3. Reduce community emissions to 83 percent below 2008 levels by 2050 (i.e., 97,113 MT CO_2e/yr).

The RCAP describes measures that can achieve the 2020 reduction target and work toward the 2035 target. Focus on the 2050 reduction target was reserved for future reevaluation of long-term GHG reduction efforts to reflect future conditions and adjustment of emission reduction measures accordingly. The RCAP relies on the State RPS goals that will lead to an increase in renewable electricity, reduce the community energy-related emissions in unincorporated Shasta County, and make it easier for the community to achieve 2020 and 2035 emission reduction goals (Shasta County, 2012). While the RCAP was not ultimately adopted by the Shasta County AQMD Board, it was designed to set GHG emissions reduction targets consistent with AB 32 and CARB's adopted Scoping Plan.

3.10.2 Significance Criteria

A project would result in a significant impact to GHG emissions if it would:

a) Generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment; or

b) Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

3.10.3 Direct and Indirect Effects

3.10.3.1 Methodology

Neither CEQA Guidelines Section 15064.4 nor any other law requires or endorses a specific analytical methodology or quantitative criteria for determining the significance of GHG emissions.[4] Rather, lead agencies are to make a "good faith effort" to "describe, calculate or estimate" GHG emissions and to consider the extent to which the project would: increase or reduce GHG emissions; exceed a locally applicable threshold of significance; or comply with "regulations or requirements adopted to implement a statewide, regional, or local plan for the reduction or mitigation of greenhouse gas emissions." A project may be found to have a less-than-significant impact related to GHG emissions if it complies with an adopted plan that includes specific measures to sufficiently reduce GHG emissions (14 Cal. Code Regs. §15064[h][3]).

As noted in the Regulatory Setting above, the RCAP includes a GHG emission inventory and forecast, emission reduction measures, and an implementation and monitoring program for unincorporated Shasta County, and was finalized in 2012. However, the RCAP was not ultimately adopted by the Shasta County AQMD Board. The RCAP also does not provide specific reduction targets or CEQA significance thresholds for individual development projects. Therefore, while the RCAP is discussed in this analysis with regard to consistency with plans, the RCAP is not used to determine the impact of Project GHG emissions.

Other prominent air districts in northern California, such as the Bay Area Air Quality Management District and the Sacramento Metropolitan Air Quality Management District, have established project-level thresholds of 1,100 MT CO_2e per year (BAAQMD, 2017; SMAQMD, 2018). In addition, the California Air Pollution Control Officers Association (CAPCOA) recommended an interim 900 MT CO_2e per year screening level as a theoretical approach to identify projects that require further analysis and potential mitigation (CAPCOA, 2008). However, these quantitative thresholds were developed to address land use development projects and stationary sources of GHG emissions, and do not directly apply to the proposed wind power generation Project.

Because an adopted quantitative threshold does not apply to this Project, and since the Project by its nature of renewable energy generation would result in an offset of GHG emissions, this analysis uses a no net annual increase of GHG emissions threshold to determine whether the Project's GHG emissions would be significant. GHG emissions from construction and decommissioning, operational emissions, the loss of carbon sequestration capacity from tree removal, and the offset of emissions from fossil-fuel powered energy sources were combined to determine whether the Project would result in a net increase in GHG emissions.

[4] See *Center for Biological Diversity v. Department of Fish and Wildlife* (2015) 62 Cal.4th 204 (identifying three "potential options" for lead agencies evaluating cumulative significance of a proposed land use development's GHG emissions and explicitly stating that none of the three options came with a "guarantee" that it would be sufficient if later challenged.)

As a conservative estimate, GHG emissions include construction emissions annualized over the 40-year life of the Project, as well as operational emissions. Construction emissions can be amortized over a project lifetime, so that GHG reduction measures can address construction GHG emissions as part of the operational GHG reduction strategies. Other prominent air districts in northern California, such as the Bay Area Air Quality Management District and the Sacramento Metropolitan Air Quality Management District, have provided estimates for the operational life of buildings ranging from 25 to 40 years (BAAQMD, 2017; SMAQMD, 2018). However, the operational life of a wind energy facility may not coincide with the operational life of a building. As discussed in Chapter 2, *Project Description*, although upgrading and replacing equipment could extend the operating life of the wind energy facility indefinitely, for CEQA purposes, the life of the Project would be coterminous with the term of the use permit that is requested for its operation, i.e., 40 years. Therefore, the construction GHG emissions in this analysis are amortized over 40 years to consider the impact over the duration of the Project's initially permitted time frame. Any proposed extension of the term of the use permit would require approval of a use permit amendment and would be subject to subsequent environmental review. Decommissioning and site reclamation emissions are assumed to be equivalent to construction emissions and are also annualized over the 40-year life of the Project.

The potential loss of sequestration capacity from tree removal and offset of emissions from fossil-fuel powered energy sources are also considered for the Project in determining whether there would be a net increase in GHG emissions as a result of the Project. The CalEEMod forestland carbon biogenic emissions rate was used to estimate the potential loss of sequestration capacity. Other methodologies to estimate carbon sequestration, such as that contained in CARB's *Compliance Offset Protocol U.S. Forest Projects*, were considered, but may require on-site plot sampling to determine actual on-site carbon inventories (CARB, 2015). Thus, CalEEMod values for forestland with trees were used to calculate sequestration capacity which is more generalized, but results in conservative modeling. The potential offset of emissions from fossil-fuel powered energy sources was estimated using a value developed by CARB representing the GHG reduction resulting from the displacement of generation from the grid by renewable resources (CARB, 2010).

The potential for the Project to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing emissions of GHG was assessed by examining any potential conflicts of the Project with the GHG reduction measures related to implementation of SB 32, including the potential conflict with CARB's *Climate Change Scoping Plan* and RPS-related goals.

3.10.3.2 Direct and Indirect Effects of the Project

a) Whether the Project would generate GHG emissions, either directly or indirectly, that may have a significant impact on the environment.

Impact 3.10-1: The Project would generate GHG emissions, directly and indirectly. (*Less-than-Significant Impact*)

Construction, operation, and decommissioning of the Project would generate GHG emissions. The use of fossil fuels in construction equipment and motor vehicles would generate GHGs such as CO_2, methane, and nitrous oxide. During the operations and maintenance period, the Project

would generate GHG emissions primarily from motor vehicle use by commuting workers, fugitive emissions from equipment containing SF_6 gas, emergency generator testing, and O&M building electricity use, solid waste generation, and water use. See Section 3.3, *Air Quality*, Impacts 3.3-2a and 3.3-2b, for a discussion of methodology used to calculate emissions from construction equipment and motor vehicle use. O&M building electricity use, solid waste generation, and water use-related emissions were estimated using default emission factors from the CalEEMod model.[5] Helicopter emissions that would be associated with conductor line stringing for the overhead collection system and transmission line connection were estimated manually using emissions factors obtained from The Climate Registry (TCR, 2019).

Construction, Decommissioning, and Site Reclamation

Project construction is expected to last up to 24 months, but no work would occur during the winter months (i.e., January 1 through March 31). Year 1 construction activities would include timber removal and grubbing, grading and access road work, temporary concrete batch plant construction, and foundation work. Year 2 construction activities would include turbine and transformer installation, substation and O&M building installation, underground and overhead connector system work, the transmission line connection, and substation aggregate and security fencing installation. Sources of GHG emissions would include off-road equipment, a helicopter, and on-road vehicles (e.g., haul trucks and worker vehicles). Project construction would also require water for dust control, to batch concrete, emergency fire suppression, and for other activities. Water used during construction would generate indirect GHG emissions through the consumption of electricity associated with water supply. **Table 3.10-1**, *Estimated Construction Greenhouse Gas Emissions*, presents construction emissions for the Project for construction Year 1, Year 2, and construction water use from on-site and off-site emission sources. It is assumed that Project decommissioning and site reclamation emissions would result in a similar amount of emissions as described in Table 3.10-1 for the construction activities. Additional details on calculations can be found in Appendix B.

TABLE 3.10-1
ESTIMATED CONSTRUCTION GREENHOUSE GAS EMISSIONS

Year and Activity	CO_2e (metric tons)
Year 1	5,106
Year 2	4,687
Water Use	17
Total	**9,810**
Amortized Annual Emissions over 40 Years	245

NOTES: Columns may not total precisely due to rounding.
CO_2e = carbon dioxide equivalent

SOURCE: Appendix B

[5] Since CalEEMod does not have demand factors specifically for wind O&M facilities, emissions were calculated using demand factors for a heavy industrial type building. This is a conservative assumption as the demand factors assume a high number of employees and the manufacturing of large items.

Construction emissions can be amortized over a project lifetime, so that GHG reduction measures can address construction GHG emissions as part of the operational GHG reduction strategies. The life of the Project is assumed to be the same as the term of the use permit that is required for its operation, i.e., 40 years. Thus, the total construction, decommissioning, and site reclamation GHG emissions were calculated, amortized over 40 years, and added to the total operational emissions for comparison with the GHG significance threshold of no net annual increase in GHG emissions as a result of the Project.

As shown in Table 3.10-1, the estimated total GHG emissions during Project construction would be approximately 5,106 MT CO_2e in Year 1, 4,687 MT CO_2e in Year 2, and 17 MT CO_2e from construction-related water use for a total of 9,810 MT CO_2e over the up to 21-month construction period (2 years with no construction in January through March). Estimated Project-generated construction emissions amortized over 40 years, would be approximately 245 MT CO_2e per year.

GHG emissions generated during construction of the Project would be short-term in nature, and would not represent a long-term source of GHG emissions. Emissions associated with decommissioning and site reclamation of the Project were conservatively assumed to be the same as those from construction, 245 MT CO_2e per year, and so also would not represent a long-term source of GHG emissions. This is a conservatively assumption, as some construction activities such as tree removal and grading for access roads would not be required during decommissioning activities. The total amortized construction, decommissioning, and site reclamation GHG emissions were added to the total operational emissions for comparison with the GHG significance threshold of no net increase in GHG emissions (see below).

Operation and Maintenance

Operation and maintenance of the Project would generate GHG emissions through worker motor vehicle trips to and from the Project site; emergency generator testing, energy use (electricity consumed by the Project, as required when the Project is not powered by on-site energy generation); cranes used to access turbines for maintenance work; mowers used for maintenance; solid waste disposal; SF_6 leaked from circuit breakers at the proposed substation site; and consumption of electricity associated with water supply. The annual GHG emissions calculations are based on the operational assumptions presented in Appendix B.[6]

SF_6 has a high global warming potential and is used for insulation in electric power transmission and distribution equipment. During operation and maintenance, one of the sources of GHG emissions would be fugitive emissions from equipment containing SF_6 gas installed at the proposed substation. Based on an approved substation of similar voltage that will have a combined SF_6 capacity of 289 pounds (CPUC, 2018), it is conservatively assumed that this equipment would use up to 1,000 pounds of SF_6 with a leak rate of 0.5 percent. This leak-rate is less than allowed under CARB's *Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear* (17 Cal. Code Regs. §95350 et seq.), which requires that annual emissions of SF_6 must not exceed 1.0 percent after 2020; however, the new equipment would be required to comply with the International Electrotechnical Commission standard for new

[6] Since CalEEMod does not have demand factors specifically for wind O&M facilities, emissions were calculated using demand factors for a heavy industrial type building, as shown in the CalEEMod output.

equipment leakage, which is 0.5 percent per year (USEPA, 2017). Thus, annual SF_6 emissions leaked would be approximately 5 pounds per year, or approximately 52 MT CO_2e.

As shown in **Table 3.10-2**, *Estimated Annual Operational Greenhouse Gas Emissions*, estimated annual Project-generated GHG emissions would be approximately 318 MT CO_2e per year as a result of Project operation. Estimated annual Project-generated operational emissions and amortized Project construction, decommissioning, and site reclamation emissions would be approximately 809 MT CO_2e per year.

TABLE 3.10-2
ESTIMATED ANNUAL OPERATIONAL GREENHOUSE GAS EMISSIONS

Emission Source	CO_2e
Commuting workers	137
Emergency Generator Testing	10
O&M Building Electricity Use and Solid Waste	17
Cranes and Mowers Used for Maintenance	96
Fugitive Emissions (SF_6)	52
Water Use	5
Total Operation	**318**
Amortized Annual Construction Emissions over 40 Years	245
Amortized Annual Decommissioning and Site Reclamation Emissions over 40 Years	245
Total Operation and Construction	**809**
Amortized Loss of Carbon Sequestration over 40 Years	1,977
Displaced use of traditional energy source per year	-227,917
Total Net Emissions	**-225,131**

NOTES: Columns may not total precisely due to rounding; co_2e = carbon dioxide equivalent; O&M Building includes electricity and solid waste.

SOURCE: Appendix B

The Project would result in the permanent conversion of up to 713 acres of timberland to develop power generation facilities that would be used for the duration of the Project's operational time frame. Based on the CalEEMod forestland carbon biogenic emissions rate of 111 MT CO_2/acre, the Project could result in a loss of approximately 79,143 MT CO_2 of carbon sequestration capacity or approximately 1,977 MT CO_2 per year amortized over the life of the Project.[7] However, as discussed in Chapter 2, *Description of the Project and Alternatives*, all timber within the permanent and temporary disturbance areas, including the areas to be replanted after construction, would continue to grow and would not be affected by operation of the Project. The permanent disturbance area also would be revegetated upon completion of the Project's operational life to be as similar to preconstruction conditions as possible. In coordination with the

[7] Tree removal and associated loss of CO_2 sequestration is considered to result in a one-time carbon-stock change. This value has been amortized to consider the impact over the duration of the Project's operational time frame.

land owner, disturbed areas would be replanted with trees. The goal of site revegetation would be to develop a vegetation cover, composition, and diversity similar to the area's ecological setting and consistent with the landowner's current and future land use practices.

Renewable energy offsets GHG emissions generated by fossil-fuel power plants to the extent that it serves demand that otherwise would be served with a fossil-fuel powered source. For the most part, the power being displaced would be comprised of incremental power provided by generators to address load changes, which is typically provided by natural gas power plants. According to CARB, each MWh of wind generation could displace approximately 830 pounds CO_2e or 0.38 MT CO_2e from natural gas peaking plants (CARB, 2010). As discussed in Section 3.7, *Energy*, using the Project's total nameplate generating capacity of up to 216 MW and conservatively assuming an average capacity factor of 32 percent, the Project is anticipated to generate up to approximately 605,491 MWh per year. Thus, the Project would provide a potential net offset of 227,917 MT CO_2e per year[8] if the electricity generated by the Project were to be used in place of electricity generated by fossil-fuel sources. After accounting for the annualized construction and decommissioning, and annual operational emissions of 809 MT CO_2e per year, and the annualized loss of carbon sequestration capacity during the Project's operational time frame, the Project would provide a potential net offset of 225,131 MT CO_2e per year. Therefore, the Project would not result in net increase in GHG emissions, and the impact would be less than significant. Overall, this would be a beneficial impact.

Mitigation: None required.

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b) Whether the Project would conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

Impact 3.10-2: The Project could conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. (*Less-than-Significant Impact*)

Consistency with State GHG Reduction Targets and RPS Goals

The Project would involve the construction, operation and maintenance, and decommissioning and site reclamation of a wind power facility that would produce a new renewable source of energy in Shasta County. Therefore, the Project would directly support the 40 percent reduction in GHG emissions by 2030 target under the 2017 Scoping Plan Update and targets of SB 100 for increasing California's procurement of electricity from renewable sources to 60 percent by 2030 and to 100 percent by 2045. Because carbon-free energy is a pivotal element of achieving statewide GHG reductions, the Project would also provide direct support to Executive Order B-55-18 and the new statewide goal of achieving carbon neutrality (zero net GHG emissions) by 2045 and maintaining net negative emissions thereafter.

[8] 605,491 MWh * (830 lbs CO_2e per MWh/2,205 lbs per MT) = 227,917 MT

The RCAP[9] relies on compliance with the RPS standard of 33 percent by 2020, as a part of State actions that would reduce communitywide GHG emissions supporting a 49 percent GHG reduction target by 2035. Therefore, the Project would directly support the emission reduction goals of the RCAP and facilitate exceeding the reduction projections related to RPS from the RCAP. Additionally, while the RCAP deferred adjustment of emission reduction measures related to the 83 percent reduction target by 2050, the Project would directly support meeting this reduction target through contributing to meet new RPS goals since publication of the RCAP. Because the development of the RCAP, the State has increased its RPS goal to 100 percent by 2045 through SB 100 as described above. The Project would help the State to meet that target.

Consistency with the Regional Sustainable Communities Strategy

If the Project were to be found inconsistent with the SRTA 2018 RTP/SCS based on a qualitative assessment of the Project's consistency with SRTA's Sustainable Communities Strategy policies, there could be a conflict with a GHG reduction plan. The GHG emission reduction goals in the SRTA 2018 RTP/SCS are based on demographic data trends and projections that include household, employment, and total population statistics. Because the Project does not propose housing, and would not result in a population increase, only the Project's contribution to employment would need to be considered.

The STRA 2018 RTP/SCS relies on estimates that employment within the region is projected to grow to approximately 14,702 jobs in 2040, an increase of approximately 21 percent from 2015 (SRTA, 2018b). The Project construction, decommissioning, and site reclamation workforces would be temporary, lasting up to 24 months of employment, and would be expected to come from the existing construction labor pool in Shasta County. Other specialized workers may reside outside the local area. Non-local workers would stay at local hotels and commute to the Project Site. The Project is anticipated to have up to 12 full-time employees. Therefore, the additional jobs estimated by the Project would be well within the growth projections for the 2018 RTP/SCS.

Additionally, 2018 RTP/SCS strategies are intended to increase population and employment density within Strategic Growth Areas. The general area around Burney is identified as a Strategic Growth Area in the 2018 RTP/SCS. Because the Project would facilitate the opportunity for local employment in the area surrounding Burney, which would support vehicle miles travelled and associated GHG per capita emissions reductions, the Project would be consistent with the 2018 RTP/SCS. Therefore, the Project would be consistent with the SRTA 2018 RTP/SCS, and the Project would have a less-than-significant impact with regard to potential conflicts.

Consistency with the Forest Carbon Plan

The Project would result in the permanent conversion of up to 713 acres of timberland for development of power generation facilities for the duration of the Project's operational time frame. As described under Impact 3.10-1, while the Project could result in a loss of approximately 79,143 MT CO_2 of carbon sequestration capacity, the Project would offset that loss through the potential reduction of 227,917 MT CO_2e per year if the electricity generated by the Project were

[9] While the RCAP was not ultimately adopted by the Shasta County AQMD Board, it was designed to set GHG emissions reduction targets consistent with AB 32 and CARB's adopted Scoping Plan.

to be used in place of electricity generated by fossil-fuel-sourced generation. Existing commercial and pre-commercial timber would be harvested, treated, and/or removed from the Project Site to allow development of the Project. Areas that would be removed from timber production as a result of the Project would be harvested in accordance with a Timberland Conversion Permit (TCP) and Timber Harvesting Plan (THP) authorization from CAL FIRE and environmental Best Management Practices would be implemented during harvesting. The Applicant would also prepare a Project-specific Fire Prevention Plan (FPP) prior to the commencement of on-site activities that would include procedures for fire prevention and vegetation management. The landowner, separate from and independent of the Project, is also installing helicopter dip tanks throughout the leasehold to aid fire suppression, including within the Project Site.

Altogether, while the Project would result in the loss of timberland that sequesters carbon, the Project would offset the amount of carbon sequestration capacity lost during Project operation and implement an FPP in order to prevent potential extensive carbon losses that could occur during and after extreme wildfires in forests, consistent with the Forest Carbon Plan. Additionally, the Project Site would also be revegetated, including replanted with trees, upon completion of the Project's operational life to be as similar to preconstruction conditions as possible.

Consistency with Other Regulations

As described under Impact 3.10-1, during operation and maintenance, one of the sources of GHG emissions would be fugitive emissions from equipment containing SF_6 gas installed at the proposed on-site substation. The Project would comply with CARB's *Regulation for Reducing Sulfur Hexafluoride Emissions from Gas Insulated Switchgear* (17 Cal. Code Regs. §95350 et seq.), which requires that annual emissions of SF_6 must not exceed 1.0 percent after 2020.

Conclusion

Therefore, considering the above, development of the Project would not conflict with any applicable plans, policies, or regulations adopted with the intent to reduce GHG emissions. The impact would be less than significant.

Mitigation: None required.

3.10.3.3 PG&E Interconnection Infrastructure

Upgrades to PG&E facilities to facilitate the interconnection between the Project's electrical substation and the PG&E transmission lines are anticipated to include construction and/or reconfiguration of utility line structures and transmission line circuits involving four to six new transmission poles. If required, these new poles are anticipated to occur adjacent to the proposed substation and switching station. The construction equipment, workers, and vehicle trips required for upgrades to these facilities and maintenance would be minimal compared to overall Project construction and operational activities, and are captured by the Project's GHG emissions calculations. Therefore, activities associated with the PG&E interconnection infrastructure would also result in a less-than-significant impact relating to GHG emissions.

3.10.3.4 Direct and Indirect Effects of Alternatives

Alternative 1: South of SR 299

Alternative 1, would implement the Project exclusively in that portion of the Project Site located south of SR 299: none of the up to seven turbines proposed to the north of SR 299 (turbine numbers A01 through A07) or related infrastructure would be developed. Alternative 1 could have a total nameplate generating capacity of up to 195 MW, or approximately 21 MW fewer total nameplate generating capacity as compared to the Project. The number of workers and durations of construction, operation and maintenance, and decommissioning and site reclamation would be substantially the same as for the Project, resulting in similar GHG emissions.

Alternative 1 would continue to provide a new source of renewable energy supporting SB 100 and the state's GHG reduction goals and would have less-than-significant impacts in regard to generation of GHG emissions and conflicts with plans, policies, or regulations adopted for the purpose of reducing GHG emissions. However, the reduced generating capacity also would contribute to a reduced overall benefit in terms of GHG emissions if the electricity generated by the Project were to be used in place of electricity generated by fossil-fuel sources. Overall, Alternative 1 would result in no significant impacts to GHG emissions; and the impact conclusions would be the same as those identified for the Project.

Alternative 2: Increased Setbacks

Under Alternative 2, proposed setbacks would be increased relative to the Project to preclude turbine construction within three times the height of the turbine (i.e., within 2,037 feet) of a residential property line and within 1.5 times the height of the turbine (i.e., within 1,018.5 feet) of State Route 299, any other publicly maintained public highway or street, and of Supan Road or Terry Mill Road. This would preclude the construction of four wind turbines, as compared to the Project, potentially resulting in the loss of approximately 12 to 22.8 MW of generating capacity based on generation potential per turbine.

Under Alternative 2, the number of workers and durations of construction, operation and maintenance, and decommissioning and site reclamation would be substantially the same as for the Project, resulting in similar GHG emissions. Alternative 2 would continue to provide a new source of renewable energy supporting SB 100 and the State's GHG reduction goals and would have less-than-significant impacts in regards to generation of GHG emissions and conflicts with plans, policies, or regulations adopted for the purpose of reducing GHG emissions. However, the reduced generating capacity also would contribute to a reduced overall benefit in terms of GHG emissions if the electricity generated by the Project were to be used in place of electricity generated by fossil-fuel sources. Overall, Alternative 2 would result in no significant impacts to GHG emissions; and the impact conclusions would be the same as those identified for the Project.

No Project Alternative

If the No Project Alternative is implemented, none of the proposed wind project infrastructure would be delivered to the Project Site or constructed, operated and maintained, or decommissioned there. No construction equipment or additional vehicle trips would be made to,

from, or within the site relative to baseline conditions. Ground clearance would not occur for laydown areas; utility line rights-of-way; roads; or the collector substation, switching station, or operation and maintenance (O&M) facility. Baseline levels of carbon sequestration within the Project Site would remain unchanged by the Project, and the Project Site would continue to be operated as managed forest timberlands. Because there would be no change relative to baseline conditions, the No Project Alternative would create no impact related to GHG emissions. It should be noted that the No Project Alternative would not result in the same GHG reduction benefits as the Project and associated alternatives.

The Project Site is zoned for timber production. Pursuant to regulations implementing the California Timberland Productivity Act (Government Code §51100 et seq.; 14 Cal. Code Regs. §897[a]), there is a legal presumption that "timber harvesting is expected to and will occur on such lands." The regulations further specify that timber harvesting on such lands "shall not be presumed to have a Significant Adverse Impact on the Environment" (14 Cal. Code Regs. §898). Therefore, the No Project Alternative, including anticipated timber harvesting, is not presumed to result in a significant adverse individual or cumulative effect relating to GHG emissions. CAL FIRE would review any future timber harvesting proposal to evaluate any potential site-specific environmental impacts.

3.10.4 Cumulative Analysis

GHG emissions are inherently a cumulative concern, in that the significance of GHG emissions is determined based on whether such emissions would have a cumulatively considerable impact on global climate change. Although the geographic scope of cumulative impacts related to GHG emissions is global, this analysis focuses on the state, the region, and this Project's direct and/or indirect generation or offset of GHG emissions. CAPCOA considers GHG impacts to be exclusively cumulative impacts, in that no single project could, by itself, result in a substantial change in climate (CAPCOA, 2008). Therefore, the evaluation of cumulative GHG impacts presented above evaluated whether the Project would make a considerable contribution to existing cumulative significant climate change impact. The Project would result in a 40-year long-term net offset of approximately 225,131 MT CO_2e per year and would not conflict with the State's GHG reduction goals.

In response to its notice of intention to prepare this Draft EIR, the County received scoping input including concerns that operation of the proposed wind turbines could result in a heat island effect. Studies have indicated that wind turbines may alter local climate through near-surface air temperature increases downwind of the wind farm during night and early morning hours, and near-surface air temperature decreases during the rest of the day (Roy and Traiteur, 2010). Generally, based on observations from 28 wind facilities in the U.S., daytime temperature differences were small and slightly warmer and cooler, while nighttime temperature differences were larger and almost always warmer. The observation at the site with the highest number of observed-years, is 0.02°F warmer during the day and 0.52°F warmer at night (Miller and Keith, 2018).

It is important to note that wind turbines have the potential to redistribute heat already present in the atmosphere. When wind turbines are not in operation, this effect would likely cease. As discussed in Section 3.10.1.2, *Environmental Setting*, increased GHGs in the atmosphere cause a rise in the average global temperature, and average temperatures in California could rise 5.6°F to 8.8°F by the end of the century, depending on the global trajectory of GHG emissions. Thus, while the Project may contribute to localized temperature fluctuations near the Project Site, the Project would not contribute to substantial local temperature increases when compared to projections of average long-term temperature increases for California under climate change. Additionally, the Project would continue to have the potential to offset the total GHG emissions in the state and beyond, and would not contribute to further climate change-related impacts. Therefore, the Project-specific incremental impact on GHG emissions would not be cumulatively considerable.

3.10.5 References

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3.11 Hazards and Hazardous Materials

This section identifies and evaluates potential issues related to Hazards and Hazardous Materials in the context of implementing the Project and alternatives. It includes information about the physical and regulatory setting and identifies the criteria used to evaluate the significance of potential impacts, the methods used in evaluating these impacts, and the results of the impact assessment. Data related to existing conditions present in the study area is based largely on a Phase I Environmental Site Assessment (Phase I) that was prepared for the Project by Stantec Consulting Services (Stantec) (**Appendix F1**, *Environmental Records Review*). The County independently reviewed the Phase I and found it to be suitable for reliance in combination with other sources of data in this analysis.

In response to its notice of intention to prepare this Draft EIR, the County received scoping input that suggests consideration of Shasta County's local hazard mitigation plan, which addresses wildfires and other hazards, and that identify potential causes or contributors to hazards (i.e., increased truck traffic on Moose Camp roads, activities that would disturb natural deposits of arsenic which could be released to surface waters and equipment that could leak toxic chemicals or flammable materials (e.g., transformers, turbines, or batteries). See **Appendix J**, *Scoping Report*. However, no sources of information regarding the presence of arsenic were provided and none were identified during follow-up research conducted by the EIR preparers (identified in Chapter 5, *Report Preparation*).

3.11.1 Setting

3.11.1.1 Study Area

The study area for this evaluation of hazards and hazardous materials includes the Project Site and transportation routes used to deliver or remove any hazardous materials or equipment.

3.11.1.2 Environmental Setting

Hazardous Materials

A hazardous material is defined as any material that, because of quantity, concentration, or physical or chemical characteristics, poses a significant present or potential hazard to human health and safety or to the environment if released into the workplace or the environment (Health and Safety Code §25501[o]). The term "hazardous materials" refers to both hazardous substances and hazardous wastes. Under federal and state laws, any material, including wastes, may be considered hazardous if it is specifically listed by statute as such or if it is toxic (causes adverse human health effects), ignitable (has the ability to burn), corrosive (causes severe burns or damage to materials), or reactive (causes explosions or generates toxic gases).

Hazardous wastes are hazardous substances that no longer have practical use, such as materials that have been spent, discarded, discharged, spilled, contaminated, or are being stored until they can be disposed of properly (22 Cal. Code Regs. §66261.10). Soil that is excavated from a site containing hazardous materials is a hazardous waste if it exceeds specific regulatory criteria

(22 Cal. Code Regs. §§66261.20–66261.24). While hazardous substances are regulated by multiple agencies, as described in Section 3.11.1.3, *Regulatory Setting*, cleanup requirements of hazardous wastes are determined on a case-by-case basis according to the agency with lead jurisdiction over the release.

Potential Receptors/Exposure

The sensitivity of potential receptors in areas of known or potential hazardous materials contamination depends on several factors. The primary factor is the potential pathway for human exposure. Exposure pathways include dermal exposure, inhalation, and ingestion of contaminated soil, air, water, or food. The magnitude, frequency, and duration of human exposure can cause a variety of health effects, from short-term acute symptoms to long-term chronic effects, depending on the specific material.

Hazardous Materials Database Search

The Phase I included a database search report consistent with ASTM Standard Practice E1527-13. The database search includes a thorough review of environmental databases that are maintained by various federal, state, and local agencies to identify sites with releases of hazardous materials or documented uses of hazardous materials. According to the findings of the search, the Project Site was not listed on any of the databases reviewed. The closest site to the Project Site listed in any of the search results is Whitmore Gap Filler Annex, a "gap filler radar" facility that deployed in the late 1950s to alleviate the need for civilians to scan the skies for enemy bombers (MilitaryMuseum.org, 2020). The Whitmore Gap Filler Annex is located on the peak of Clover Mountain, approximately 0.84 mile southeast of the Project Site. The site has been decommissioned; its current status is listed as requiring no further action (Appendix F1; DTSC, 2014).

An independent review of the Department of Toxic Substances Control (DTSC) EnviroStor and State Water Resources Control Board (SWRCB) GeoTracker hazardous materials databases confirms the findings of the database search report by Stantec; there are no active or closed hazardous materials sites within the Project Site boundary. Both GeoTracker and EnviroStor databases further confirm the Whitmore Gap Filler Annex site as the closest listed site to the Project Site (SWRCB, 2020; DTSC, 2020).

Schools and Day Care Centers

The nearest school to the Project Site is the Montgomery Creek Elementary School. It is located approximately 1.5 miles from the western boundary of the Project Site.

Airports

There are three public airports in Shasta County: The Redding Municipal Airport, Benton Airpark, and Fall River Mills Airport. Shasta County also is home to one private airport Tews Field-CA53. The nearest airport to the Project Site, the Fall River Mills Airport, is located approximately 20 miles northeast of the Project Site.

Blasting

As described in Section 2.4.5.1, blasting may be required in advance of excavation for the installation of trenches, for example, depending on the subsurface conditions. Federal, state and local agencies regulate the use, storage, packaging, labeling, and transportation and other aspects of blasting, including, but not limited to, the Occupational Safety and Health Administration (OSHA); the federal Bureau of Alcohol, Tobacco, Firearms and Explosives (ATF); the U.S. Department of Transportation (USDOT); California Division of Occupational Safety and Health (Cal/OSHA), and Shasta County. Local and state laws regulating explosives may be more restrictive than federal requirements. The Applicant's prime construction contractor(s) and any pertinent sub-contractors would comply with the most stringent provisions of applicable federal, state, and local laws governing explosives, and that the plan would address at least the following: safety measures relating to any onsite storage, protection of people and property, fire safety, and transportation; environmental protection measures that avoid or minimize impacts to sensitive environmental resources (including biological resources, cultural resources, wells and springs, and nearby residents, e.g., from vibration, dust or noise.

3.11.1.3 Regulatory Setting

Federal

Hazardous Materials Management

The primary federal agencies with responsibility for hazardous materials management include the U.S. Environmental Protection Agency (USEPA), U.S. Department of Labor Occupational Safety and Health Administration (OSHA), and the U.S. Department of Transportation (DOT). With respect to hazardous materials, state and local agencies often have either parallel or more stringent regulations than federal agencies. In most cases, state law mirrors or overlaps federal law and enforcement of these laws is the responsibility of the state or of a local agency to which enforcement powers are delegated. For these reasons, the requirements of the law and its enforcement are discussed under either the state or local agency section.

Resource Conservation and Recovery Act

The Resource Conservation and Recovery Act of 1976 (RCRA, 42 USC §6901 et seq.) is the principal law governing the management and disposal of hazardous wastes. RCRA regulates the generation, transportation, treatment, storage, and disposal of hazardous waste, referred to as from "cradle to grave." Under RCRA, individual states may implement their own hazardous waste programs in lieu of RCRA as long as the state program is at least as stringent as federal RCRA requirements and is approved by the USEPA. The USEPA approved California's RCRA program, referred to as the Hazardous Waste Control Law (Health and Safety Code §25100 et seq.) in 1992.

Hazardous and Solid Waste Act

The Hazardous and Solid Waste Act (HSWA) amended RCRA in 1984, affirming and extending the "cradle to grave" system of regulating hazardous wastes. The amendments specifically prohibit the use of certain techniques for the disposal of some hazardous wastes.

Emergency Planning and Community Right-to-Know Act

The Emergency Planning and Community Right-to-Know Act (EPCRA, 42 USC §11001 et seq.) from the Superfund Amendments and Reauthorization Act (SARA) Title III improved community access to information regarding chemical hazards and facilitated the development of business chemical inventories and emergency response plans. EPCRA also established reporting obligations for facilities that store or manage specified chemicals. EPCRA applies to this Project because the contractors who would be called upon to properly manage hazardous materials and, if needed, to clean up accidental spills, remove hazardous materials from the Project Site, and/or to construct remediation systems would be required to prepare and implement written emergency response plans in accordance with EPCRA.

Hazardous Materials Transportation Act

The Hazardous Materials Transportation Act of 1975 (49 USC §§5101–5127) empowered the Secretary of Transportation to designate as hazardous materials that may pose an unreasonable risk to health and safety or property. The DOT, in conjunction with the USEPA, is responsible for enforcement and implementation of federal laws and regulations pertaining to safe storage and transportation of hazardous materials. DOT Regulations implementing the Act (49 CFR Parts 171–180) regulate the transportation of hazardous materials, types of material defined as hazardous, and the marking of vehicles transporting hazardous materials. This Act applies to this Project because contractors who participate in its development, operation, maintenance and decommissioning would be required to comply with its storage and transportation requirements to reduce the possibility of spills. Federal and state agencies determine driver-training requirements, load labeling procedures, and container specifications. Although special requirements apply to transporting hazardous materials, requirements for transporting hazardous waste are more stringent, and hazardous waste haulers must be licensed to transport hazardous waste on public roads.

Occupational Safety and Health Act

Requirements of the Occupational Safety and Health Act (29 USC § 651 et seq.) are administered by OSHA, the agency responsible for assuring worker safety in the handling and use of chemicals in the workplace. The federal regulations pertaining to the safety and health of construction workers are contained in Part 1926 of Title 29 of the Code of Federal Regulations (29 CFR §1926.1 et seq.). They provide standards for safe workplaces and work practices, including standards relating to hazardous materials handling. At sites known or suspected to have soil or groundwater contamination, construction workers must receive training in hazardous materials operations and a site health and safety plan must be prepared. The health and safety plan establishes policies and procedures to protect workers and the public from exposure to potential hazards at the contaminated site.

Oil Pollution Prevention

Under the authority of Clean Water Act Section 311, the Oil Pollution Prevention regulations (40 CFR Part 112) establish procedures, methods, equipment, and other requirements to prevent discharges from non-transportation-related onshore and offshore facilities into the waters of the United States. These regulations require facilities with a single tank or cumulative aboveground storage capacities of 1,320 gallons or greater of petroleum to prepare and implement a Spill

Prevention, Control, and Countermeasure (SPCC) Plan (40 CFR §112.1). The purpose of an SPCC Plan is to form a comprehensive federal/state spill prevention program that minimizes the potential for discharges. The SPCC Plan must address all relevant spill prevention, control, and countermeasures necessary at the specific facility for which the SPCC Plan is written. These regulations are relevant to the Project because more than 5,000 gallons of diesel fuel would be stored in aboveground tanks on the Project Site during construction and operation, and because a comparable amount also could be present during decommissioning and site restoration.

Federal Aviation Administration Regulations on Objects Affecting Navigable Airspace

The Federal Aviation Administration (FAA) is the federal agency that identifies potential impacts related to air traffic and related safety hazards. The FAA's Federal Aviation Regulations (FAR) establish standards and notification requirements for objects affecting navigable airspace (see Advisory Circular [AC] 70/7460-1L) and also helipads (AC 150/5390-2C). Specifically regarding the marking and lighting of obstructions that have been deemed to be a hazard to air navigation, FAA standards and Advisory Circular 70/7460-1L (FAA, 2018) generally require any temporary or permanent structure, including appurtenances, that exceeds an overall height of 200 feet (61 m) above ground level (AGL) to meet the requirements to be marked and/or lighted. For this Project, the requirements would apply to the proposed meteorological evaluation towers (METs) and wind turbines.

State

The Z'Berg-Nejedly Forest Practice Act of 1973 (Pub. Res. Code §§4511–4360.2) and its implementing regulations, the Forest Practice Rules (14 Cal. Code Regs. §895 et seq.), govern the management of privately owned forestlands in California, including the servicing of logging equipment, disposal of refuse, litter, trash and debris. Rule 914.5, 934.5, 954.5, for example, establishes the following performance standard in connection with the servicing of logging equipment: "Equipment used in timber operations shall not be serviced in locations where servicing will allow grease, oil, or fuel to pass into lakes or watercourses" (14 Cal. Code Regs. §914.5, 934.5, 954.5).

California Department of Toxic Substances Control

The California Department of Toxic Substances Control (DTSC) is responsible for regulating the use, storage, transport, and disposal of hazardous substances in the state. The hazardous waste regulations establish criteria for identifying, packaging, and labeling hazardous wastes; prescribe management of hazardous waste; establish permit requirements for hazardous waste treatment, storage, disposal, and transportation; and identify hazardous waste that cannot be disposed of in landfills. DTSC also maintains a Hazardous Waste and Substances Site List for site cleanup. This list is commonly referred to as the Cortese List. Government Code Section 65962.5 requires the California Environmental Protection Agency (CalEPA) to update the Cortese List at least annually. DTSC is responsible for a portion of the information contained in the Cortese List. Other state and local government agencies are required to provide additional hazardous material release information for the Cortese List.

State Water Resources Control Board

The State Water Resources Control Board (SWRCB) and the Regional Water Quality Control Boards (RWQCBs) administer the requirements of the Clean Water Act that regulate pollutant discharges into waterways of the U.S. The Project is proposed within the jurisdiction of the Central Valley RWQCB, Redding Office.

Construction of the Project would disturb more than 1 acre of land surface, and so could affect the quality of stormwater discharges into waters of the U.S. The Project therefore would be subject to the Construction General Permit, more formally known as the National Pollutant Discharge Elimination System (NPDES) General Permit for Stormwater Discharges Associated with Construction and Land Disturbance Activities (Order 2009-0009-DWQ, NPDES No. CAS000002; as amended by Orders 2010-0014-DWQ and 2012-006-DWQ). See Section 3.12, *Hydrology and Water Quality*, for additional details about the Construction General Permit.

Unified Hazardous Waste and Hazardous Materials Management Regulatory Program

Regulations implementing a Unified Hazardous Waste and Hazardous Materials Management Regulatory Program (Unified Program) address six elements: hazardous waste generators and hazardous waste on-site treatment; underground storage tanks; aboveground storage tanks; hazardous materials release response plans and inventories; risk management and prevention programs; and Unified Fire Code hazardous materials management plans and inventories. The Certified Unified Program Agency (CUPA) is the local agency responsible for the implementation of the Unified Program. The Shasta County Environmental Health Division is the designated CUPA, and would serve in this capacity for the Project.

Hazardous Materials Release Response Plans and Inventory Law

The California Hazardous Materials Release Response Plan and Inventory Law of 1985 (Business Plan Act, Health and Safety Code §25500 et seq.) requires businesses that store or use hazardous materials to prepare a Hazardous Materials Business Plan (HMBP) and submit it to the CUPA, discussed above. An HMBP includes details of a facility and business conducted at the site, an inventory of hazardous materials that are handled and stored on-site, an emergency response plan, and a safety and emergency response training program for new employees with an annual refresher course.

Hazardous Materials Transportation

In addition to DOT regulations, the State regulates the transportation of hazardous waste originating in the State and passing through the State. Both regulatory programs apply in California. The two state agencies with primary responsibility for enforcing federal and state regulations and for responding to hazardous materials transportation emergencies are the California Highway Patrol (CHP) and California Department of Transportation (Caltrans). The CHP enforces hazardous materials and hazardous waste labeling and packing regulations to prevent leakage and spills of material in transit and to provide detailed information to cleanup crews in the event of an accident. Vehicle and equipment inspection, shipment preparation, container identification, and shipping documentation are the responsibility of the CHP, which conducts regular inspections of licensed transporters to assure regulatory compliance. Caltrans has emergency chemical spill

identification teams at as many as 72 locations throughout the state that can respond quickly in the event of a spill.

Occupational Safety

The California Department of Industrial Relations Division of Occupational Safety and Health (Cal/OSHA) has primary responsibility for developing and enforcing workplace safety regulations in California. Because California has a federally approved OSHA program, state regulations are at least as stringent as those found in Title 29 of the CFR.

Cal/OSHA regulations concerning the use of hazardous materials in the workplace require employee safety training, safety equipment, accident and illness prevention programs, hazardous substance exposure warnings, and emergency action and fire prevention plan preparation. Cal/OSHA enforces hazard communication program regulations, which contain training and information requirements, including procedures for identifying and labeling hazardous substances, and communicating hazard information relating to hazardous substances and their handling. The hazard communication program also requires that Safety Data Sheets (SDSs) be available to employees, and that employee information and training programs be documented. These regulations also require preparation of emergency action plans, such as escape and evacuation procedures, rescue and medical duties, alarm systems, and training in emergency evacuation.

Emergency Response

Pursuant to the Emergency Services Act (Government Code §8550 et seq.), California has developed an Emergency Plan to coordinate emergency services provided by federal, state, and local governmental agencies and private persons. Response to hazardous materials incidents is one part of this plan. The plan is administered by the State Office of Emergency Services (OES). The OES coordinates the responses of other agencies, including the USEPA, CHP, California Department of Fish and Wildlife (CDFW), the RWQCBs (in this case, the Central Valley RWQCB), the local air districts (in this case, the Shasta County Air Quality Management District) and local agencies. The State Emergency Plan defines the "policies, concepts, and general protocols" for the proper implementation of the California Standardized Emergency Management System (SEMS). The SEMS is an emergency management protocol that agencies within the State of California must follow during multi-agency response efforts whenever state agencies are involved.

Local

Shasta County General Plan

Section 5.6, *Hazardous Materials*, of the Shasta County General Plan describes the following objectives and policies regarding hazardous materials as they related to the Project (Shasta County, 2004).

Objectives:

***HM-1*:** Protection of life and property from contact with hazardous materials through site design and land use regulations and storage and transportation standards.

***HM-2*:** Protection of life and property in the event of the accidental release of hazardous materials through emergency preparedness planning.

Policies:

HM-a: The County shall make every effort to inform applicants for discretionary and nondiscretionary projects which are located within potential border zone property of known hazardous waste facilities that they must comply with State requirements regarding hazardous waste facilities. A map shall be prepared and maintained which identifies these areas.

HM-b: Shasta County shall maintain an emergency preparedness plan for hazardous materials.

HM-c: Shasta County shall adopt policies for hazardous materials use, transportation, storage and disposal as required by State laws.

HM-d: Shasta County shall adopt policies for the protection of life and property from contact with hazardous materials through site design and land use regulations.

HM-e: Any proposal for development of a disposal site for hazardous wastes in Shasta County shall be reviewed closely to ensure that no significant environmental impacts will result from the project. Review of such project may include a determination of what type of hazardous wastes may be disposed of at the site.

Emergency Response

The Shasta County Sheriff's Office of Emergency Services (OES) coordinates with Federal, State, and local agencies to prepare, respond, and recover from emergencies and natural disasters. OES is responsible for maintaining and updating the County Emergency Operation Plan (EOP), which is an all hazards plan for Shasta County. The Shasta County Multi-Jurisdictional Hazard Mitigation Plan (SCHMP) was approved in November 2017 and includes resources and information to assist in planning for hazards (Shasta County and City of Anderson, 2017). The SCHMP provides a list of actions that may assist the jurisdictions in reducing risk and preventing loss from future hazard events.

3.11.2 Significance Criteria

CEQA Guidelines Appendix G Section IX identifies considerations relating to hazards and hazardous materials. See Section 3.1.4, *Environmental Considerations Unaffected by the Project or Not Present in the Project Area*, as it relates to the County's analysis of the potential impacts of this Project to the considerations suggested in CEQA Guidelines Appendix G Section IX. Otherwise, for purposes of this analysis, a project would result in a significant impact to Hazards or Hazardous Materials if it would:

a) Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials;

b) Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment;

c) Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

CEQA Guidelines Appendix G Section IX(g) suggests that a project also would result in a significant impact to Hazards or Hazardous Materials if it would expose people or structures, either directly or indirectly, to a significant risk of loss, injury or death involving wildland fire. Potential impacts relating to wildland fire are analyzed in Section 3.16, *Wildfire*.

3.11.3 Direct and Indirect Effects

3.11.3.1 Methodology

The following analysis is based on existing conditions as determined by the Project-specific Phase I and publicly available information from various local, state, and federal agencies.

3.11.3.2 Direct and Indirect Effects of the Project

a) Whether the Project would create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials.

Impact 3.11-1: The Project could create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials or wastes. (*Less-than-Significant Impact*)

Project implementation would require the use of common hazardous substances, such as gasoline and diesel fuel, oils and lubricants, hydraulic fluid, and solvents to maintain vehicles and motorized equipment. See Table 2-3, Hazardous Materials, which lists the hazardous materials that are expected to be used during site preparation and construction, operation and maintenance, and decommissioning and site restoration phases of the Project. Routine uses of any of these substances could pose a hazard to people or the environment and would be considered potentially significant.

Fuel tanks would be maintained and operated according to all local, state, and federal regulations during construction and operation, and hazardous material storage would be detailed in the Spill Prevention, Countermeasure, and Control (SPCC) Plan. Refueling and general maintenance for construction equipment, such as changing fluids and lubricating parts, would also be subject to sufficient containment capabilities and according to measures outlined in the SPCC Plan.

In accordance with requirements contained in the Health and Safety Code and the California Code of Regulations, the Applicant would prepare a Hazardous Materials Business Plan/Spill Prevention Control and Countermeasures Plan (HMBP/SPCC) prior to construction. The HMBP would include best management practices (BMPs) for the transport, storage, use, and disposal of hazardous materials and waste. The HMBP also would include information regarding construction activities, worker training procedures, and hazardous materials inventory procedures. Prior to operation, the Applicant would update the HMBP (including the BMPs) with information about the types of hazardous materials that would be used during operation.

During construction, waste disposal and collection receptacles would be located onsite to ensure proper disposal of hazardous materials in accordance with regulatory requirements.

Project construction activity would be subject to the Construction General Permit and its required SWPPP, which include BMPs to control hazardous materials used for construction.

Operation, maintenance, and decommissioning of the Project would result in the transportation, storage, use or disposal of fewer hazardous materials compared to construction or decommissioning. During operation, relatively limited quantities of hazardous materials would be stored in the O&M facility and storage sheds in accordance with regulatory requirements and the HMBP. Batteries may be stored at the substation. Monthly inspections would occur to check for leaks and spills. Routine maintenance activities are expected to include, but not be limited to: checking torque on tower bolts and anchors; checking for cracks and other signs of stress on the turbine tower and other turbine components; inspecting for leakage of lubricants, hydraulic fluids and other hazardous materials, and replacing them as necessary; inspecting the grounding cables, wire ropes and clips, and surge arrestors; cleaning; and repainting. Compliance with applicable federal, state, and local regulations and the applicable BMPs and HMBP would ensure that any potential impact would be less than significant during Project operation and maintenance.

The impacts of transportation, storage, use and disposal of hazardous materials would be substantially the same during decommissioning as during construction. As such, the requirements and regulations applicable to the construction phase also would apply during decommissioning to adequately control potential impacts.

Compliance with applicable federal, state, and local requirements summarized in Section 3.11.1.3, *Regulatory Setting*, and related BMPs and plans would ensure that the Project does not create a significant hazard to the public through the routine transport, use, or disposal of hazardous materials. Therefore, this impact would be less than significant.

Mitigation: None required.

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b) Whether the Project would create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment.

Impact 3.11-2: The Project could create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. (*Less-than-Significant Impact*)

During all Project phases, activities may involve the transportation, storage, use, or disposal of a variety of hazardous materials, including batteries, hydraulic fluid, diesel fuel, gasoline, propane, antifreeze, dielectric fluids, explosives, herbicides, grease, lubricants, paints, solvents, and adhesives. Ground disturbing activities also could inadvertently release naturally occurring arsenic in the form of fugitive dust or sediment in stormwater if arsenic is present on the Project Site.

The HMBP/SPCC would include BMPs for these activities as well as spill control and spill response measures. In the unlikely event that a spill did occur, the SPCC would include appropriate measures to ensure that workers cease work activities to contain any release and enact the protocols for cleanup including the notification of appropriate agencies and the use of materials stored onsite such as absorbent pads to minimize the spread or exposure.

Accidents or mechanical failure involving heavy equipment could result in the accidental release of fuel, lubricants, hydraulic fluid, or other hazardous substances. These types of spills on construction sites are typically in small quantities, localized, and cleaned up in a timely manner. Construction contractors are contractually responsible for their hazardous materials and are required under their contract to properly store and dispose of these materials in compliance with state and federal laws, including implementing a HMBP/SPCC. As discussed, the Project would require coverage under the Construction General Permit, and so would be subject to the protections included in a SWPPP, which would outline BMPs to contain a potential release and to prevent any such release from reaching an adjacent waterway or stormwater collection system (e.g., erosion control, sediment control, and waste management). Therefore, implementation of the SWPPP would minimize potential adverse effects to groundwater and soils.

Because, compliance with applicable federal, state, and local regulations and the applicable BMPs and HMBP/SPCC plan would ensure that the Project would not result in significant hazards to the public or environment related to accidental release of hazardous materials the impact would be less than significant.

Arsenic is found widely in nature, in trace amounts, including in rocks and sediments (Vaughn, 2006; USEPA, 1998). Inorganic arsenic occurs naturally in many types of rocks (USEPA, 1998), including basaltic and andesitic rocks (Vaughn, 2006; Smedley and Kinniburgh, 2002), which are present at the Project Site. However, there is no available data to suggest that there are elevated concentrations of arsenic within the Project Site. For this reason, the Project would result in a less-than-significant impact relating to the potential creation of a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of naturally occurring arsenic into the environment. If arsenic is present in abundance in the rocks at the Project Site, then construction activities could inadvertently release arsenic into the air. As discussed in Section 3.3, *Air Quality*, the implementation of Mitigation Measure 3.3-2c (Fugitive Dust Controls) to address Impact 3.3-2c would provide further assurance that any fugitive dust emissions containing naturally occurring arsenic would be less than significant. As stated in Section 3.9, *Geology and Soils*, the depth to groundwater is more than 230 feet below ground surface; therefore, the potential risk of Project-caused transport of naturally occurring arsenic to groundwater would be remote. The SWPPP discussed in Section 3.12, *Hydrology and Water Quality*, would provide further assurance that any construction runoff that might contain naturally occurring arsenic in the rocks would not contaminate the groundwater. Additionally, any naturally occurring arsenic in the rock would be present prior to any Project-related ground disturbance, and so the Project would not exacerbate the existing conditions, and would not expose people or the environment to a significant risk associated with arsenic contamination.

Mitigation: None required.

Impact 3.11-3: During normal operation, equipment failure or an extreme event could lead to turbine failure, resulting in a potential hazard. (*Less-than-Significant with Mitigation Incorporated*)

"Tower failure" refers to the collapse of a wind turbine or meteorological tower. "Rotor failure," also known as "blade throw," refers to the disconnection of a wind turbine blade or blade fragment from the tower, typically due to equipment failure or an extreme event such as a lightning strike. Other potential causes could include failure of turbine control/safety system, human error, design error, or poor manufacturing quality (Larwood, 2005).

Tower failure and blade throw are rare. Available documentation indicates that blade failure probability is in the range of 1-in-100 to 1-in-1000 per turbine per year (Larwood, 2005). Further, based on independent research, the EIR preparers were unable to identify any reported injury to a member of the public from a turbine or meteorological tower failure or blade throw. This is consistent with information disseminated by the American Wind Energy Association (AWEA), which reports that "no member of the public has ever been injured by a turbine" (AWEA, 2020). Nonetheless, persons and facilities within a tower failure or blade throw hazard zone could be at risk of damage, injury or death if struck. If a blade or fragment of a blade detaches from the hub, the distance it travels is dependent upon a number of factors including the release velocity (which is a function of the turbine tip speed), tower height, topographic setting, blade or blade fragment length, rotor speed, wind speed, and departure angle.

The Applicant proposes to strictly control access to the wind energy facility, limiting access to Project facilities to persons approved for access by the Applicant. Access to the larger Project Area is controlled by the underlying land owner. Where necessary, safety and "No Trespassing" signs would be posted around towers, transformers, other high-voltage facilities, and along roads in accordance with federal and state regulations. This strict control of public access would reduce the risk of exposure of potential Project hazards to members of the public on the Project Site to a less-than-significant level. The Applicant also proposes that the Project operator would monitor turbines through a Supervisory Control and Data Acquisition (SCADA) monitoring system 24 hours a day, seven days a week. This system would allow the Applicant to perform self-diagnostic tests and would allow a remote operator to perform system checks, establish operating parameters, and ensure that the turbines are operating at peak performance. National Renewable Energy Laboratory (NREL) research indicates that continuous monitoring of wind turbine health using a SCADA system can improve turbine reliability by detecting failures before they reach a catastrophic stage (NREL, 2011). The proposed continuous monitoring of the automated SCADA system would be sufficiently protective of the 12 employees who could be onsite while turbines are operating. For these reasons, a less-than-significant impact would result for O&M personnel and for members of the public within the Project Site.

To address the risk of public exposure to thrown fragments from rotor failure beyond project site boundaries, many jurisdictions have adopted "setback requirements," which establish minimum

distances between wind turbines and neighboring property lines, roads, and occupied structures. Neither the State of California nor Shasta County has adopted setback requirements for wind turbines. In other jurisdictions, required setbacks vary, but usually are based on overall turbine height, i.e., the tower height plus the blade radius. For example:

- Kern County requires a minimum wind generator setback of 2 times the overall turbine height or 500 feet, whichever is less, from exterior project site boundaries adjacent to existing parcels of record that contain less than 40 acres; where neighboring property is greater than 40 acres, then the setback must be the lesser of 1.5 times the overall turbine height or 500 feet. Regardless of parcel area, the minimum required setback from any off-site residence is the greater of 1.5 times the overall turbine machine height or 500 feet (Kern County Code of Ordinances Section 19.64.140, Kern County, 2005).
- Solano County requires wind turbine generators to be set back at least 1.25 times the overall turbine height to any property line (Solano County Code of Ordinances §28.80, Solano County, 2012).
- San Bernardino County requires a setback from off-site residence(s) on adjacent parcels that is the greater of 1.5 times the overall turbine height or 1,500 feet (San Bernardino County Code §84.29.030, San Bernardino County, 2010).
- Riverside County requires a setback of 3 times the overall turbine height from the lot line of any lot containing a "habitable dwelling" and 1.1 times the overall turbine height from all other lot lines, and at least 1.25 times the overall turbine height from any public road or highway (Riverside County Code §17.224.040, Riverside County, 2002).
- El Dorado County also requires a setback of the greater of 3 times the overall turbine height or 500 feet (El Dorado County Code Table 130.40.390.2, El Dorado County, 2015).
- Yolo County also requires a setback from any adjacent parcel containing an offsite residence of the greater of 3 times the overall turbine height or 1,000 feet; the setback to any publicly maintained public highway or street, any public access easement, including any public trail, pedestrian easement, or equestrian easement, or railroad right-of-way is the lesser of 1.5 times the overall turbine height or 500 feet (Yolo County Code §8-2.1103[i], Yolo County, 2014).

Informed by multiple other jurisdictions' requirements, this analysis considers a project to have a significant impact relating to turbine or meteorological tower failure or blade throw if it would be set back less than 2 times the overall turbine height (i.e., 1,358 feet) from the lot line of any off-site residence or 1.25 times the overall turbine height (848.75 feet) from any public road or highway based on the maximum overall turbine height of 679 feet as identified in Chapter 2, *Description of Project and Alternatives*.

Based on these thresholds, all of the proposed turbines would be farther from public roads or highways than that threshold. However, two of the proposed turbines (turbines M03 and D05 as shown on Figure 2-2, *Site Plan*) would be located closer to residential lot lines than the threshold. Although the risk of hazard relating to turbine or meteorological tower failure or blade throw from turbines M03 and D05 would be low, the potential consequences of such an event could be high, and so would be significant unless mitigated. Mitigation Measure 3.11-3, if implemented, turbines M03 and D05 would not be constructed.

Mitigation Measure 3.11-3: Mandatory Setbacks.

A minimum wind turbine setback of two times the total tip height shall be maintained from the exterior Project boundaries where the Project Site is adjacent to existing parcels of record that contain an off-site residence.

Significance after Mitigation: Less than significant.

Impact 3.11-4: During normal operation, weather conditions could lead to ice shed from turbine blades, resulting in a potential hazard. (*Less-than-Significant Impact*)

Ice shed can occur as air temperatures rise, causing ice on turbine blade to thaw and for ice fragments to drop from the rotors to the ground near the base of the turbine (Morgan et al., 1998). Ice also can be thrown from an operating turbine due to aerodynamic and centrifugal forces. A Swiss report entitled *Wind Turbine Ice Throw Studies in the Swiss Alps* (Cattin et al., 2014) confirms that underneath the turbine is the most dangerous place for ice-related wind turbine hazards, and cautions that in arctic conditions, approximately 5 percent of ice fragments can land more than 80 meters (approximately 262.5 feet) from the turbine. GE, a wind turbine manufacturer, reported in 2006 that "rotating turbine blades may propel ice fragments some distance from the turbine— up to several hundred meters if conditions are right" (Wahl and Giguere, 2006). The actual distance that ice could be expected to travel would depend on several factors, including turbine dimensions, rotational speed, weather and especially the wind conditions, the instrumentation of the wind turbine's control system, and on the strategy of the control system itself (see, e.g., Seifert et al., 2003).

Based on independent research, the EIR preparers were unable to identify any reported injury as a result of ice throw from wind turbine. This is consistent with information disseminated by the American Wind Energy Association (AWEA), which reports that "no member of the public has ever been injured by a turbine" (AWEA, 2020). Nonetheless, accumulations of ice on wind turbine blades can pose a risk to O&M personnel and, to a much lesser extent, to the general public.

The risk to both groups is considered low predominantly because ice buildup would slow a turbine's rotation, which would be sensed by a turbine's SCADA system, causing the turbine to shut down. As described in Section 2.4.6, *Operation and Maintenance*, the Project operator would monitor turbines through the SCADA system 24 hours a day, seven days a week. Further, risk literature indicates that environmental cues (e.g., observing ice on wind turbines or hearing ice cracking or falling) result in protective action. Nearly all (92.9 percent) of the O&M personnel surveyed as part of a study of perceived risk and response to the wind turbine ice throw hazard (Klaus, 2017) reported that the principal reaction to environmental cues was for the wind farm to reduce exposure risk by issuing "site stand down orders" evacuating the immediate area and suspending all field work. They also reported that their companies had safety procedures in place for wind turbine icing, and a substantial number of workers (79.7 percent) reported that their company's safety procedures were very to extremely effective for protecting them in the event of an ice throw occurrence (Klaus, 2017).

For this Project, members of the public would not have access to the Project facilities and unauthorized access would be discouraged via locked gates and signage. Standard setbacks typically are sufficient to protect against potential dangers to the public from ice throw (AWEA, 2020). In any event, when asked about responses to environmental cues, the most common response of members of the public was to "stay away" or "keep their distance" from the wind turbines (Klaus, 2017). Any potential risk to illegal trespassing members of the public from ice throw would not put a substantial number of people at risk. (See the analysis of Impact 3.3-5 in Section 3.3, *Air Quality*, regarding the low population in the immediate area). For these reasons, the potential for the Project to result in a potential hazard to a substantial number of people due to ice throw would be less than significant.

Mitigation: None required.

Impact 3.11-5: During normal operations, applications of certain pesticides could result in a potential hazard. (*Less-than-Significant Impact*)

Scoping input identified the use of glyphosate weed killers such as Roundup as having potential to cause cancer and/or deoxyribonucleic acid (DNA) disruption, resulting in sterility and deformities. As explained in Section 2.4.8.3, *Hazardous Materials*, "If deemed necessary, herbicides would be brought to the site and applied by a licensed applicator." Glyphosate is generally acknowledged to be the most widely used agricultural pesticide worldwide: It is registered in 130 countries, has been approved for weed control in more than 100 crops, and is present in more than 750 products (Valavanidis, 2018). Thus, while it is possible that an herbicide that does not contain glyphosate could be used if deemed necessary, it also is possible that an herbicide that does contain glyphosate could be used on the Project Site.

The potential carcinogenic and genotoxic properties of glyphosate are widely debated within the scientific community. On one hand, the International Agency for Research on Cancer (IARC), a research arm of the World Health Organization, classified glyphosate as "probably carcinogenic" in March 2015 (IARC, 2015). On the other hand, a host of other agencies and entities have reached the contrary conclusion that there is no convincing evidence that glyphosate poses a risk for various types of cancer in humans and no convincing evidence of direct DNA damage *in vitro* or *in vivo* (Valavanidis, 2018; de Roos et al., 2005). For example, in a 2013 study, the German Institute for Risk Assessment evaluated approximately 450 toxicological studies and considered approximately 900 publications from scientific journals before concluding that "available data do not show carcinogenic or mutagenic properties of glyphosate nor that glyphosate is toxic to fertility, reproduction or embryonal/fetal development in laboratory animals" (BfR, 2013). In the United States, a collaborative effort of investigators from the National Cancer Institute, the National Institute of Environmental Health Sciences, the Environmental Protection Agency, and the National Institute for Occupational Safety and Health resulted in series of studies collectively called the Agricultural Health Study (AHS) (NIH, 2018, 2020). The AHS studies of cancer, reproductive health, and other health outcomes between 1990 and 2015 among 52,394 licensed private pesticide applicators (mostly farmers) and 32,345 of their spouses from Iowa and North Carolina, and 4,916 commercial pesticide applicators. The 2018 update's conclusion that

"Glyphosate use was not associated with overall cancer risk" is consistent with the 2005 AHS research finding that "Glyphosate exposure was not associated with cancer incidence overall or with most of the cancer subtypes we studied" (NIH, 2018; de Roos et al., 2005).

A review undertaken in 2000 (Williams et al., 2000) to evaluate the human health risk of glyphosate showed that glyphosate does not bioaccumulate in animal tissue, and that no significant toxicity occurred in acute, subchronic, or chronic studies. Further, "There was no convincing evidence for direct DNA damage in vitro or in vivo, and it was concluded that Roundup and its components do not pose a risk for the production of heritable/somatic mutations in humans…. There were no effects on fertility or reproductive parameters in two multigeneration reproduction studies with glyphosate. Reviewers concluded that 'under present and expected conditions of new use, there is no potential for Roundup herbicide to pose a health risk to humans.'"

Recognizing the ongoing debate about the use of glyphosate weed killers such as Roundup that is occurring internationally and nationally, and that also is an issue of local concern, the County is persuaded by the detailed, ongoing research conducted in the United States by the National Cancer Institute, the National Institute of Environmental Health Sciences, the Environmental Protection Agency, and the National Institute for Occupational Safety and Health, and concludes that there is insufficient evidence to conclude that the use, if any, of glyphosate weed killers on the Project Site would have potential to cause cancer or other adverse health outcomes. Therefore, the Project would result in a less-than-significant potential impact.

Mitigation: None required.

Impact 3.11-6: During normal operations, alternating changes in light intensity could occur when turbine blades are rotating and result in an adverse health effect. (*Less-than-Significant Impact*)

Scoping comments enquired about and suggested potential impacts associated with the alternating changes in light intensity that could occur when turbine blades are rotating (sometimes referred to as "shadow flicker"), including whether epileptic seizures, migraines or adverse impacts on mental health could be caused. Specific weather, light, timing, operational, and experiential conditions are required: shadow flicker only occurs on sunny days, when the sun is low enough on the horizon that the turbine is between the sun and the viewer (i.e., early in the day or late in the evening), the turbines must be rotating, and the viewer's eyes must be open. Shadow flicker does not occur at night, when fog or clouds obscure the sun, or when turbines are not operating. Shadow flicker also is limited in the distance from a turbine it can be perceived. It is suggested that, during normal operation, the visual flicker of the moving shadows of turbine blades could create a strobe-like phenomenon that could be a nuisance or cause adverse health effects to nearby residents.

No consistent national, state, or local standards exist for allowable frequency or duration of shadow flicker from wind turbines at the Project Site, and the County has not adopted a threshold to evaluate the potential significance of a Project-caused change. As discussed below, this

analysis considers both frequency and duration, relying on the expertise of the Epilepsy Foundation of America, the Chief Medical Officer of Health of Ontario, and the National Institutes of Health in identifying thresholds above which the Project's potential shadow-flicker-related health impacts would be considered significant, and on the expertise of the National Association of Regulatory Utility Commissioners.

The frequency of shadow flicker (i.e., the speed of the flashing light) is a function of the number of times the turbine blades turn per second. It is measured in hertz (Hz). However, the effect normally is considered a nuisance above 2.5 Hz, and more severe impacts can occur at higher frequencies. For example, the Epilepsy Foundation of America reports that exposure to flashing lights at certain intensities can trigger seizures in about 3 percent of epileptics, and that the frequency or speed of flashing light most likely to trigger epileptic seizures is between 5 and 30 Hz (EFA, 2019). Flicker frequency caused by a wind turbine is based on the rotor frequency (i.e., 0.6 to 1.0 Hz), which is in a range that is well below the frequency range for epileptic seizures. This conclusion is consistent with that reached by the Chief Medical Officer of Health of Ontario, Canada who, in a May 2010 report entitled "The Potential Health Impact of Wind Turbines," stated "About 3 per cent of people with epilepsy are photosensitive, generally to flicker frequencies between 5-30Hz. Most industrial turbines rotate at a speed below these flicker frequencies" (CMOH, 2010).

Migraines are a recurring type of headache that can cause moderate to severe pulsing or throbbing pain (MedlinePlus, 2019). Migraines affect approximately 12 percent of Americans. Researchers believe they have a genetic cause; flashing or bright lights are identified as among a variety of potential triggering factors (MedlinePlus, 2019). A National Institutes of Health (NIH) study on detection and discrimination of flicker contrast in migraine tested frequencies between 1 and 30 Hz and found that the "greatest sensitivity was seen at and above 10 Hz." No lower bound for sensitivity or effect was reported, and independent research failed to find any medical or peer-reviewed scientific study linking shadow flicker from wind turbines to a statistically significant increase in migraines among those predisposed to experience them. No evidence was found in published, peer-reviewed scientific literature linking the potential for normal operation of a wind turbine to cause flickering and adverse mental health impacts.

In summary, there is a lack of published, peer-reviewed scientific literature linking the flickering that can occur during the normal operation of a wind turbine to epileptic seizure, migraines, or adverse mental health impacts. Accordingly, potential impacts would be less than significant. Even though the Project's potential impacts relating to shadow flicker would be less than significant, the Applicant has proposed, as part of the Project design, to further consider and address the potential annoyance that could be caused by Project-related shadow flicker to those who would not be benefitting personally from the project (i.e., "project participants").

Environmental Design and Research (EDR) prepared a shadow flicker analysis on behalf of the Applicant. A copy of the analysis is provided in **Appendix F2**, *Shadow Flicker Analysis*. The County independently reviewed the shadow flicker analysis and other materials prepared by or on behalf of the Applicant and determined them to be suitable for reliance on (in combination with other materials included in the formal record) in the preparation of this analysis. The analysis

evaluated the largest of the potential project footprints (i.e., 72 Vestas V162 wind turbines, each with a rotor diameter of approximately 531.5 feet [162 meters] and a hub height of approximately 410 feet [125 meters]) within a study area that equates to roughly 10 rotor diameters (approximately 1 mile). Beyond this distance, shadow flicker effects generally are considered negligible (BERR, 2008; Appendix F2).

In its report, EDR modeled potential Project-caused shadow flicker effects at each of the 69 receptor locations within the study area and identified two (i.e., receptor #2 and receptor #58) where the duration of shadow flicker would exceed 30 hours per year – a threshold of significance recommended by the National Association of Regulatory Utility Commissioners in a 2012 report funded by the U.S. Department of Energy (NARUC, 2012). The report distinguishes between "non-participating" and "participating" receptors. Receptor #2 would be "non-participating" while #58 would be "participating." A "non-participating receptor" is a resident who would not benefit personally from the proposal; a participating receptor would receive some personal benefit from the location of turbines in the area. Studies correlating annoyance and wind turbines have found find that project participants are less annoyed by turbines than non-participants. See, e.g., Voicescu et al. (2016) ("Those who did not receive a personal benefit from having [wind turbines] in the area were found to have 4.03 times higher odds of being [highly annoyed by wind turbine shadow flicker] compared to those who did receive personal benefits"); see also Michaud et al. (2016) ("Participants with a high concern for their physical safety had 14 times higher odds of being annoyed by [wind turbine noise]"). The results for receptors #2 and #58 are summarized in **Table 3.11-1**, *Shadow Flicker Results at Receptors Predicted to Exceed 30 Hours*.

TABLE 3.11-1
SHADOW FLICKER RESULTS AT RECEPTORS PREDICTED TO EXCEED 30 HOURS

Receptor ID	Project Status	Predicted Shadow Flicker (days/year)	Predicted Max Daily Shadow Flicker (hh:mm), approximate times[a]	Turbines Contributing to Shadow Flicker
2	Non-participating	119	1:14, 6:45 PM – 8:15 PM	D04, D05
58	Participating	230	0:57, 6:45 AM – 7:30 AM 8:00 AM – 8:45 AM 4:15 PM – 5:45 PM 7:15 PM – 8:30 PM	N02, M08, M10

NOTES:
[a] The times of day represent the range of times during which each receptor could potentially experience shadow flicker throughout the year; however, no receptors will experience shadow flicker every day during all of these hours. See Attachment B for detailed calendars that illustrate the specific time of year and day that each receptor may experience shadow flicker.

SOURCE: Appendix F2, Tables 2 and 3.

Following final turbine model selection and layout, including any micro-siting of locations that may occur as part of the approval process, the Applicant proposes to prepare an updated receptor-specific shadow flicker analysis for non-participating residences. The analysis will account for any screening by existing yard trees, buildings, or proximity to stands of trees and the number and/or orientation of windows in residential receptors. It also will use Project-specific meteorological data to account for wind being below or above generation speeds. If the modeling results show that shadow flicker could exceed 30 hours per year at a non-participating residence,

then the Applicant will work with the landowner to become a Project participant, or to plant trees or install window blinds to block the shadow flicker. These mitigation options could readily be implemented even after the Project has been constructed. These further actions, if determined appropriate based on the updated receptor-specific shadow flicker analysis, would further assure that potential impacts to non-participating residences would be less than specific.

Mitigation: None required.

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c) Whether the Project would impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan.

Impact 3.11-7: The Project could impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan. (*Less than Significant with Mitigation Incorporated*)

As discussed below, the Project would not impair implementation of or, if mitigated, cause a substantial physical interference with Shasta County's EOP, which is the County's all hazards plan. The Project Site is located in a rural area adjacent to State Route (SR) 299, with three Project driveways allowing adequate egress/ingress to the site in the event of an emergency. Additionally, as part of the Project, additional onsite access roadways (internal to the site) would be constructed. During inclement winter months, emergency access could be provided to and through the Project Site via snowcats or ATVs. Therefore, development of the Project would not physically interfere with emergency vehicle access or personnel evacuation from the site in these respects. The Project would not require closures of public roads, which could inhibit access by emergency vehicles. Further, as described in Section 3.14.3.2, which analyzes the direct and indirect transportation effects of the Project, the proposed use of oversized vehicles during construction and decommissioning would not cause a significant adverse impact on emergency access to or near the Project Site if oversize load permit and related requirements are complied with. The implementation of Mitigation Measure 3.11-7 would assure that emergency access would be maintained during construction and decommissioning.

Mitigation Measure 3.11-7: Implement the Traffic Management Plan that would be required by Mitigation Measure 3.14-3.

Significance after Mitigation: Less than significant.

3.11.3.3 PG&E Interconnection Infrastructure

The proposed an onsite collector substation and switching station would increase the voltage of the electricity from the collection system's 34.5 kV to 230 kV to match the voltage of the existing PG&E 230 kV line and the Project would tap into the existing PG&E 230 kV line via an aboveground line tap located directly adjacent to the switching station. Minor modifications or upgrades to the existing 230 kV line may be required to facilitate the Project's interconnection. The work also could require the construction and/or reconfiguration of utility line structures and

transmission line circuits involving four to six new transmission poles. As designed, the Project would protect public safety by restricting public access, enclosing the onsite substation with a chain-link fence, and posting safety and "No Trespassing" signs around towers, transformers, and other high-voltage facilities.

No mitigation would be required specific to the PG&E interconnection infrastructure. As part of the Project, construction, operation, maintenance and decommissioning of the PG&E interconnection infrastructure would result in a less-than-significant impact relating to: the creation of a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials or wastes, or reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. It also (like the Project) would cause a less-than-significant impact relating to hazards associated with the application of certain pesticides during normal operations. Because no turbines or related oversize loads would be required for the subset of Project activities required to construct, operate, maintain, or decommission the PG&E interconnection infrastructure, neither Mitigation Measure 3.11-3 (Mandatory Setbacks) nor Mitigation Measure 3.11-7 (implementation of the Traffic Management Plan that would be required by Mitigation Measure 3.14-3) would be required in connection with the PG&E interconnection infrastructure, and there would be no impact relating to shadow flicker.

3.11.3.4 Direct and Indirect Effects of Alternatives

Alternative 1: South of SR 299

Under Alternative 1, no turbines would be erected north of SR 299. The elements of Alternative 1 that would be required to comply with applicable hazardous materials storage, transportation, use, and disposal regulations, along with stormwater permitting regulations would be the same as those described for the Project. The Project components also would be the same in type, if fewer in number. Like the Project, Alternative 1 would result in a less-than-significant impact relating to: the creation of a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials or wastes, or reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. It also (like the Project) would cause a less-than-significant impact relating to hazards associated with the application of certain pesticides during normal operations. Because turbine construction and operation would be the same as for the project, although restricted to the area south of SR 299, oversize loads would be needed to deliver turbine components. Similar to the Project, Mitigation Measure 3.11-7 (Traffic Management Plan) would be implemented to ensure that emergency access would be maintained during construction and decommissioning reducing impacts to less than significant. Also similar to the Project, there would be a less-than-significant impact relating to shadow flicker.

Similar to the Project, two turbines (M03 and D05) would be located closer to the property lines of private residential lots than 2 times the turbine height, resulting in a significant impact should a blade throw event occur at either of these turbines. This potential impact would be mitigated to less than significant with the implementation of Mitigation Measure 3.11-3 (Mandatory Setbacks) which would prohibit the construction of turbines M03 and M05.

Alternative 2: Increased Setbacks

The elements of Alternative 2 that would be required to comply with applicable hazardous materials storage, transportation, use, and disposal regulations, along with stormwater permitting regulations would be the same as those described for the Project. The Project components also would be the same in type, if fewer in number, as the Project.

Similar to the Project, Alternative 2 would result in a less-than-significant impact relating to: the creation of a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials or wastes, or reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment. Alternative 2 also (like the Project) would result in a less-than-significant impact relating to hazards associated with the application of certain pesticides during normal operations. Because oversize loads would be needed to deliver turbine components, Mitigation Measure 3.11-7 (Traffic Management Plan) would be required, to ensure emergency access during construction and decommissioning, reducing the impact to less than significant.

Alternative 2 would differ from the Project by precluding the construction, operation and maintenance of turbines within three times the height of the turbine (i.e., within 2,037 feet) of a residential property line and would require setbacks of 1.5 times the height of the turbine (i.e., within 1,018.5 feet) of private as well as public roads. This would result in four of the Project turbines (M03, D05, B01 and K02) not being constructed. As a result, Alternative 2 would result in a less-than-significant impact relative to whether, during normal operation, equipment failure or an extreme event could lead to a turbine failure resulting in a blade throw. Under Alternative 2, Mitigation Measure 3.11-3 (Mandatory Setbacks) would not be required. Given the greater distance between proposed turbines and potential visual receptors, the less-than-significant impact of the Project relating to shadow flicker would be even more remote under Alternative 2 particularly with respect to receptor #2, because turbine D05 (which would contribute to shadow flicker at this location) would not be constructed.

No Project Alternative

If the No Project Alternative is implemented, none of the proposed wind project infrastructure would be constructed, operated and maintained, or decommissioned on the Project Site. No potential hazards to air navigation would be installed on the Project Site, no Project-related vehicles or equipment would be present, and no hazardous materials would be transported, used, or disposed of in connection with the Project. The Project Site would continue to be operated as managed forest timberlands. Because there would be no change relative to baseline conditions, the No Project Alternative would create no impact related to Hazards and Hazardous Materials.

The Project Site is zoned for timber production. Pursuant to regulations implementing the California Timberland Productivity Act (Government Code §51100 et seq.; 14 Cal. Code Regs. §897[a]), there is a legal presumption that “timber harvesting is expected to and will occur on such lands.” The regulations further specify that timber harvesting on such lands “shall not be presumed to have a Significant Adverse Impact on the Environment” (14 Cal. Code Regs. §898). Therefore, the No Project Alternative, including anticipated timber harvesting, is not presumed to

result in a significant adverse individual or cumulative effect relating to Hazards or Hazardous Materials. CAL FIRE would review any future timber harvesting proposal to evaluate any potential project-specific, site-specific environmental impacts.

3.11.4 Cumulative Analysis

The geographic scope for cumulative effects relating to hazards and hazardous materials would be the Sacramento Valley Air Basin, watershed and groundwater basin boundaries (see Section 3.12, *Hydrology and Water Quality*), and the Project materials delivery routes, including I-5 (approximately 35 miles to the west of the Project Site), SR 139 (approximately 60 miles to the east of the Project Site), SR 299, Moose Camp Road, and the three existing, gated logging roads that would be used for direct Project access. Cumulative hazards and hazardous materials-related effects could arise at any point during the Project, from the commencement of construction through operation and maintenance and decommissioning-related activities.

The Project would result in a less-than-significant impact regarding the transport, use, disposal of hazardous materials; and upset and accident conditions involving the release of hazardous materials. Current and reasonably foreseeable projects would be required to comply with the same federal, state, and local regulatory requirements described above that would minimize and/or avoid such impacts. Compliance with these regulations is effective in minimizing releases where emissions or accidental releases tend to be localized and do not combine to become cumulatively considerable. Therefore, considering the localized nature of effects, the temporal and geographic variations in occurrences, any emissions or incidents would not combine to cause a significant cumulative impact. Regarding potential impacts that could occur during normal turbine operations, no other turbines could experience tower failure, blade throw or ice shedding. There is no existing cumulative impact to which the project or an alternative could contribute, and the cumulative effect would be less than significant. The potential for the use, if any, of glyphosate weed killers on the Project Site to cause or contribute to a significant cumulative effect also would be less than significant: there is no evidence of an existing significant impact (i.e., cancer, DNA damage, infertility) attributable to the use of glyphosate weed killers in the relevant geographical area, and insufficient evidence to conclude that the use of such products on the Project Site would cause one. Similarly, there is no evidence of an existing significant impact relating to shadow flicker in the relevant geographical area, and insufficient evidence to conclude that the less-than-significant incremental impact of the Project would cause one. Accordingly, the Project would result in less-than-significant cumulative effects related to hazards and hazardous materials.

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3.12 Hydrology and Water Quality

This section identifies and evaluates issues related to hydrology and water quality in the context of the Project and alternatives. It includes information about the physical and regulatory setting and identifies the criteria used to evaluate the significance of potential impacts, the methods used in evaluating these impacts, and the results of the impact assessment.

The Central Valley Regional Water Quality Control Board (RWQCB) provided initial input for the County's environmental review process shortly after the CUP application was filed for the Project (RWQCB, 2018a). Later, in response to the issuance of notice of intention to prepare this Draft EIR, the County received scoping input about hydrology- and water quality–related considerations from a variety of sources. All scoping input received, including issues raised pertaining to hydrology and water quality, is provided in Section 4.1 of the Scoping Report, a copy of which is provided in **Appendix J**, *Scoping Report*.

3.12.1 Setting

3.12.1.1 Study Area

The study area considered for this analysis of water resources includes the Project Site, which includes all areas of temporary and permanent disturbance (described in Table 2-1), as well as downstream portions of the waterways intersecting the Project Site and the undefined groundwater basins beneath the Project Site that could be impacted by the proposed construction, operation, and decommissioning activities.

3.12.1.2 Environmental Setting

Climate, Precipitation, and Site Topography

Shasta County is located in a Mediterranean climate, characterized by hot, dry summers and cold winters. Annual precipitation falling in the form of rain and snow measured at Round Mountain (3 miles west of the Project Site) is 63 inches on average (WRCC, 2010). By contrast, the annual average precipitation measured in Burney (approximately 6 miles east of the Project Site) is just 28 inches (WRCC, 2015). Thus, eastern portions of the County, including some eastern locations within the Project Site, are likely to receive considerably less precipitation due to rain shadow effects associated with the mountainous terrain. The Project Site is located in the southern portion of the Cascade Range, in the northern Sacramento River Hydrologic Region. Shasta County is located at the headwaters of California's largest watershed, the Sacramento River Basin. As noted in the County's General Plan, about 6.5 percent of all surface runoff in the state of California originates in Shasta County, amounting to more than one-fourth of the total surface runoff within the Sacramento River system, the state's largest source of domestic and agricultural water supplies (Shasta County, 2004). Elevations within the Project Site range from 3,000 to 6,000 feet above mean sea level.

Surface Water Hydrology

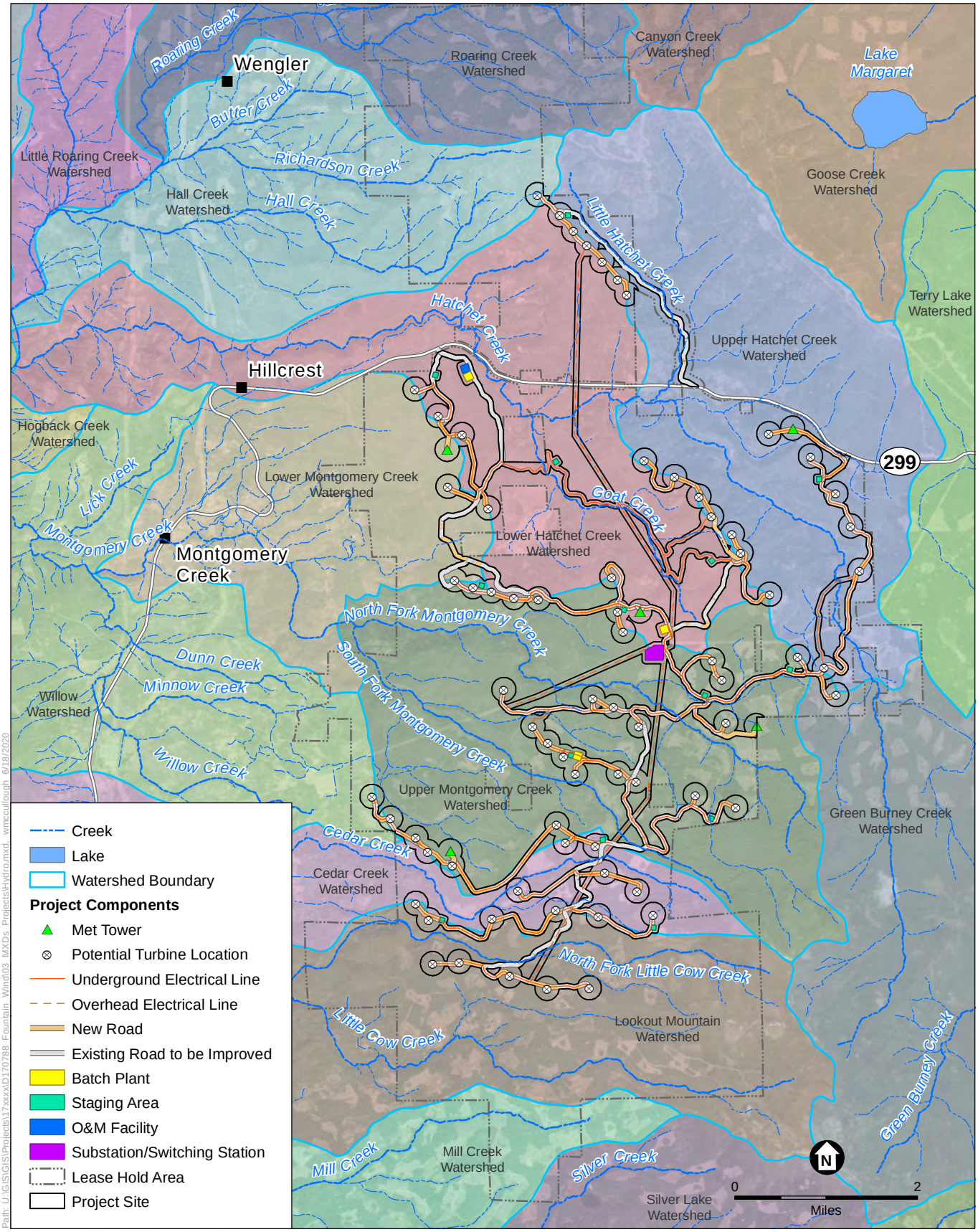
The Project Site is within the Whitmore and Pit River Units of the Sacramento River Hydrologic Region. Waterways in each of these hydrologic units ultimately flow west to the Sacramento River. The lower Pit River watershed drains to the Sacramento River and Lake Shasta (i.e., the confluence of the Pit River and the Sacramento River is within the area inundated by Shasta Dam). Lake Shasta is operated as a surface storage reservoir by the U.S. Bureau of Reclamation, and is managed by the Central Valley Project, as a major water supply resource for the state. **Figure 3.12-1**, *Surface Waters and Hydrology*, depicts the surface waters, watersheds, and hydrology within and surrounding the Project Site. Multiple smaller watersheds span the Project Site including Lower and Upper Hatchet Creek, Lower and Upper Montgomery Creek, Green Burney Creek, and portions of Cedar Creek and Lookout Mountain. Multiple surface waters generally flow from east to west/northwest through the Project Site including Hatchet Creek, Montgomery Creek, Goat Creek, Indian Springs, Willow Creek Cedar Creek, Blue Lake, Little Cow Creek, Mill Creek, Cheddar Creek, Sawdust Creek, and Buffum Creek. In addition to approximately 8 miles of streams and creeks, as well as intermittent streams and other water features, some contributing to approximately 38 acres of wetlands that have been identified within the Project Site. Wetlands and riparian habitats are described in more detail in Section 3.4, *Biological Resources*, and in **Appendix C2**, which contains an Aquatic Resources Survey Report that was prepared for the Project. Due to the local terrain for watersheds in the Project's vicinity, hydrologic conditions for surface waters tend to be flashy in the winter months and dry in the summer, depending on conditions for snowmelt and winter rains.

Water Quality

Surface waters and groundwater in Shasta County have been described as generally having high quality from a drinking water perspective (Shasta County, 2004). Post-fire conditions (such as those following the recent regional fires, described under the heading "Fire History" in Section 3.1.2.1, *Cumulative Scenario*) influence surface water quality, as water flowing through burned areas is likely to carry increased levels of sediment, organic debris, and chemicals (such as residuals from fire suppressants), contributing to degradation of water quality and aquatic resources (Shasta County, 2016). Timber harvesting activities in the region also have affected surface waters through delivery of silt, sediment, and increasing turbidity through runoff. Disturbance processes and effects on hydrology following a forest harvest or wildfire event are emerging areas of research in the region (USGS, 2014).

Groundwater

As described in Section 3.9, *Geology and Soils*, and shown in Figure 3.9-1, *Geologic Units*, the Project Site is underlain by volcanic bedrock. Groundwater basins underlying the Project Site are undefined. The closest defined groundwater basins are Burney Valley Groundwater Basin and Dry Burney Valley Basin beyond the ridge to the east of the Project Site, neither of which is a "medium" or "high-priority" basin or a basin in a condition of critical overdraft regulated under the Sustainable Groundwater Management Act. Groundwater is generally considered to be of high quality throughout most of Shasta County. Depth to groundwater is highly variable, ranging from 5 feet below ground surface to more than 230 feet below ground surface, based on DWR



Fountain Wind Project

Figure 3.12-1
Surface Waters and Hydrology

groundwater well data (DWR, 2020a, 2020b; see also **Appendix I**, which contains a Project-specific Water Supply Assessment).

As noted in Section 3.15, *Utilities and Service Systems*, the Burney Water District is the closest water district to the Project Site. District supplies are sourced from groundwater, and the tap water it provides to its more than 3,000 customers (from that groundwater) complies with federal health-based drinking water standards (Environmental Working Group, 2020). With that said, soil and geologic limitations for septic tanks or on-site wastewater systems, particularly in the eastern portion of the county, have generated concerns about potential groundwater contamination (Shasta County, 2004). To install and operate the onsite septic system proposed to serve the Project's O&M facility, a permit would be required from the County. For analysis of the suitability of on-site soils to support the proposed septic tank use, see Section 3.9, *Geology and Soils*.

Flooding and Inundation Hazards

The Federal Emergency Management Agency (FEMA) has developed mapping of flood hazard risk areas through the National Flood Insurance Program (NFIP). The Project Site is located in Zone X, classified by FEMA as an area of minimal flood hazard (FEMA, 2011). The Project Site is not located in an area subject to tsunamis, seiche or dam inundation. The closest dam to the Project Site is Haynes Reservoir, located approximately 3.3 miles northeast of the Project Site. In the unlikely event of a dam failure, projected inundation would extend north and down gradient, away from the Project Site.

3.12.1.3 Regulatory Setting

Federal

Clean Water Act

Under the Federal Water Pollution Control Act, commonly referred to as the Clean Water Act (CWA), the U.S. Environmental Protection Agency seeks to restore and maintain the chemical, physical, and biological integrity of the nation's waters by implementing water quality regulations. Multiple CWA sections apply to activities near or within surface water or groundwater.

The federal Antidegradation Policy, established in 1968 under CWA Section 303, is designed to protect existing uses, water quality, and national water resources. The states implement a set of antidegradation measures when evaluating activities that may affect the quality of waters of the United States. Implementing antidegradation measures is integral to the comprehensive protection and enhancement of surface water and groundwater quality.

CWA Section 303(d) requires states to identify water bodies or segments of water bodies that are "impaired." (Impaired water bodies do not meet one or more of the water quality standards established by the state, even after point sources of pollution have been equipped with the minimum required levels of pollution control technology.) A point source is any discernible, confined, and discrete conveyance (e.g., a pipe discharge) of pollutants to a water body from

sources such as industrial facilities or wastewater treatment plants. Including a water body on the Section 303(d) List of Impaired Water Bodies triggers development of a total maximum daily load (TMDL) for that water body and a plan to control the associated pollutant or stressor on the list. The TMDL is the maximum amount of a pollutant/stressor that a water body can assimilate and still meet the water quality standards. Typically, a TMDL is the sum of the allowable loads of a single pollutant from all contributing point and non-point sources. Non-point pollutant sources are those that do not have a single, identifiable discharge point but are rather a combination of many sources. For example, a non-point source can be stormwater runoff from land that contains petroleum from parking lots, pesticides from timber harvesting operations, or sediment from soil erosion.

The regional water quality control plan (referred to as the "basin plan") identifies relevant TMDLs and specifies applicable regulatory requirements, including waste load allocations for entities that have permitted discharges. Once a water body is placed on the list of water quality limited segments, the "Section 303(d) list," the water body remains on the list until a TMDL or alternative approach is adopted and the water quality standards are attained.

The Project Site is under the jurisdiction of Region 5, the Central Valley RWQCB. The RWQCB's Basin Plan, which identifies beneficial uses, impairment statuses, and related requirements for the protection of waterways within and near the Project Site, is discussed further under regional regulations. A list of beneficial uses and impairment statuses of water bodies in the Project area is provided in **Table 3.12-1**.

TABLE 3.12-1
BENEFICIAL USES AND IMPAIRMENT STATUS

Water Body	Beneficial Use(s)	Impairment Status	Pollutants
Pit River (from confluence of N and S forks to Shasta Lake)	Municipal and Domestic Supply (MUN), Agriculture Irrigation and Stock Watering (AG), Industry Power (POW), Cold Freshwater Habitat (COLD), Warm Freshwater Habitat (WARM), Wildlife Habitat (WILD), Water Contact Recreation (REC-1), Noncontact Water Recreation (REC-2)	Impaired; at least one beneficial use is not supported and a TMDL is required.	Nutrients, source unknown; Organic Enrichment/ Low Dissolved Oxygen, source unknown; Temperature, source unknown.
Lower Hatchet Creek	COLD, WARM, WILD, REC-1, REC-2	Not listed as impaired; drains to Hogback Creek	

SOURCE: RWQCB, 2018b.

Section 404 of the CWA authorizes the U.S. Army Corps of Engineers (USACE) to regulate the discharge of dredged or fill material to waters of the U.S., including wetlands (33 USC §1344). USACE evaluates and issues site-specific individual or general (i.e., Nationwide) permits for such discharges. Because, based on a wetlands delineation prepared for the Project, construction would include stream crossings (Appendix C2, *Aquatic Resources Survey Report*), this work would include dredge and fill activity within jurisdictional waters of the U.S. and so would

necessitate a Section 404 permit. As of June 2020, USACE has not asserted a jurisdictional determination confirming whether a Section 404 Nationwide Permit would be required.

Under Section 401 of the CWA, any applicant for a federal license or permit to conduct any activity that may result in any discharge into navigable waters (such as a Section 404 permit) must provide the licensing or permitting agency with a certification that the discharge would comply with the applicable CWA provisions (33 USC §1341). If a federal permit, such as a USACE Section 404 Nationwide Permit for dredge and fill discharges, is required for the Project, then the Applicant would also need to obtain a Section 401 Water Quality Certification from the Central Valley RWQCB prior to construction. An evaluation of on-site wetlands as well as a description of proposed avoidance and minimization measures would be required as part of the permit application.

State

Porter-Cologne Water Quality Control Act

The State of California's Porter-Cologne Water Quality Control Act (Porter-Cologne Act) provides the basis for water quality regulation within California and assigns primary responsibility for the protection and enhancement of water quality to the State Water Resources Control Board (SWRCB) and the nine RWQCBs. Under the Porter-Cologne Act, the SWRCB and RWQCBs also have the responsibility for granting CWA National Pollutant Discharge Elimination System (NPDES) permits and Waste Discharge Requirements (WDRs) for certain point-source and non-point discharges to waters.

The Porter-Cologne Act allows the California SWRCB to adopt statewide Water Quality Control Plans and basin-specific water quality control plans, which serve as the legal, technical, and programmatic basis of water quality regulation statewide or for a particular region. The water quality control plans limit impacts on water quality from a variety of sources. The RWQCB Basin Plan and permit requirements relevant to this Project are described below.

California Fish and Game Code Section 1602

Pursuant to Division 2, Chapter 6, Section 1602 of the State Fish and Game Code, the California Department of Fish and Wildlife (CDFW) regulates diversion obstructions, or alterations to the natural flow or bed, channel, or bank of any river, stream or lake which supports fish or wildlife. According to the Jurisdictional Delineation, there are waters of the state on the Project site that could be subject to CDFW jurisdiction including wetland and riparian vegetation and ephemeral drainages, and perennial waterways (Appendix C2, *Aquatic Resources Survey Report*). Therefore, the Project may be required to apply for a Lake and Streambed Alteration Agreement through CDFW.

California Forest Practice Act

Areas that would be removed from timber production as a result of the Project (such as access roads and a 2-acre buffer around each proposed turbine) would be harvested in accordance with a Timberland Conversion Permit (TCP) and Timber Harvesting Plan (THP) authorization from the California Department of Forestry and Fire Protection (CAL FIRE). The Z'Berg-Nejedly Forest

Practice Act of 1973 (Pub. Res. Code §§4511–4360.2) and its implementing regulations, the Forest Practice Rules (14 Cal. Code Regs. §895 et seq.), govern the management of privately owned forestlands in California, including regarding the construction of watercourse crossings. The following Forest Practice Rules are relevant to the No Project Alternative and the Project's proposed timber harvest activities.

1. Rule 934.5 establishes the following performance standard in connection with waste disposal: "Non-biodegradable refuse, litter, trash, and debris resulting from timber operations, and other activity in connection with the operations shall be disposed of concurrently with the conduct of timber operations" (14 Cal. Code Regs. §934.5).
2. Rule 934.8 establishes performance standards for watercourse crossing facilities on tractor roads (including their planning, construction, maintenance, and removal) (14 Cal. Code Regs. §934.5).
3. Rule 936.2 establishes performance standards for the protection of the beneficial uses of water and riparian functions (14 Cal. Code Regs. §936.2).
4. Rule 936.3 prescribes general limitations near watercourses, lakes, marshes, meadows and other wet areas (14 Cal. Code Regs. §936.3).
5. Rule 936.4 regulates watercourse and lake protection (14 Cal. Code Regs. §936.4).
6. Rule 936.10 regulates domestic water supply protection (14 Cal. Code Regs. §936.10). It says: "(a) When proposed timber operations may threaten to degrade a domestic water supply the Director shall evaluate any mitigations recommended prior to the close of the public comment period (Pub. Res. Code §4582.7) and shall require the adoption of those practices which are feasible and necessary to protect the quality and beneficial use of the supply. (b) The Director may require a post-harvest evaluation of the effectiveness of the mitigations and practices designed to protect the domestic water supply as a condition of plan approval. The Director shall require an evaluation at the request of the California Regional Water Quality Control Board, or any affected water purveyor, if the necessity for the evaluation is supported by substantial evidence in the record. This evidence may include, but is not limited to, potential land failures, accelerated rate of road construction or harvesting within a watershed, concentration or intensity of harvesting activity near streams or springs. The design and implementation of the evaluation shall be done in consultation with the Director, appropriate RWQCB, and THP submitter, and the sufficiency of the information requested by the Director shall be judged in light of reasonableness and practicality."

General Order of Waste Discharge Requirements for Timberland Management Activities on Non-Federal and Federal Lands (Order No. R5-2017-0061)

Activities associated with timber harvest that could affect the quality of waters of the state are required to apply for coverage under General Order Number R5-2017-0061. As analyzed in Section 3.8, *Forestry Resources*, the Project proposes to convert private timberland acreage to a non-timber use; therefore, in addition to a TCP from CAL FIRE, the Project would require WDR coverage under General Order No. R5-2017-0061. Under the order, "timberland management activities" means commercial activities relating to forest management and timberland conversions, including, but not limited to: cutting or removal of timber and other solid wood forest products; construction, reconstruction and maintenance of roads, fuel breaks, firebreaks, watercourse crossings, landings, skid trails, or beds for the falling of trees; fire hazard abatement and fuel

reduction activities; pesticide applications; site preparation that involves disturbance of soil or burning of vegetation following timberland management activities (RWQCB, 2017). Depending on how the proposed timber management activity is categorized (e.g., as having a high or low threat to water quality), avoidance and impact minimization measures, notification for pesticide use, and design safeguards for water crossings may be imposed to protect slopes and waterways.

California Department of Pesticide Regulation

The Department of Pesticide Regulation (DPR) is the California agency responsible for implementing the NPDES Pesticide General Permit requirements. DPR's strict oversight begins with pesticide product evaluation and registration and continues through statewide licensing of commercial applicators, dealers, consultants, and other pesticide professionals; evaluation of health impacts of pesticides through illness surveillance and risk assessment; environmental monitoring of air, water, and soil; field enforcement (with county agricultural commissioners) of laws regulating pesticide use; residue testing of fresh produce; and encouraging development and adoption of least-toxic pest management practices through incentives and grants.

California's Food and Agricultural Code authorizes the state's pesticide regulatory program and mandates it to:

- Provide for the proper, safe, and efficient use of pesticides and protection of public safety.
- Protect the environment from environmentally harmful pesticides by prohibiting, regulating or ensuring proper stewardship of those pesticides.
- Assure agricultural and pest control workers have safe working conditions where pesticides are present.
- Authorize agricultural pest control by competent and responsible licensees and permittees under strict control of DPR and the state's county agricultural commissioners.
- Assure pesticides are properly labeled and appropriate for the use designated by the label, and that state or local governmental dissemination of information on uses of any registered pesticide product is consistent with the uses for which the product is registered.
- Encourage the development and implementation of pest management systems, stressing application of biological and cultural pest control techniques with selective pesticides when necessary to achieve acceptable levels of control with the least possible harm to public health, nontarget organisms, and the environment.

California Safe Drinking Water Act

The California Safe Drinking Water Act of 1996 requires the Office of Environmental Health Hazard Assessment (OEHHA) to develop public health goals for chemical contaminants to drinking water (OEHHA, 2007). Contaminants in herbicide application such as glyphosate (discussed in Section 3.11, *Hazards and Hazardous Materials*) are among the chemicals included as public health goals to prevent pollutants from entering waterways.

Regional

NPDES Construction General Permit

Construction activities disturbing 1 acre or more of land, as proposed for the Project Site, are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (Construction General Permit, Order 2009-0009-DWQ, NPDES No. CAS000002, as amended by Orders 2010-0014-DWQ and 2012-006-DWQ; SWRCB, 2014) and must apply for Construction General Permit coverage. The permit regulates stormwater discharges from construction or demolition activities, such as clearing and excavation; construction of buildings; and linear underground projects, including the installation of utility lines. This General Permit requires that stormwater discharges and authorized non-stormwater discharges must not contain pollutants that cause or contribute to an exceedance of any applicable water quality objective or water quality standards (identified in the Basin Plan). The Central Valley RWQCB administers and enforces the Construction General Permit throughout Region 5, which includes the Project Site.

For all new projects, applicants must electronically file permit registration documents using the Stormwater Multiple Applications and Report Tracking Systems (SMARTS), and must include a Notice of Intent (NOI), risk assessment, site map, and storm water pollution prevention plan (SWPPP) to be covered by the General Construction Permit prior to beginning construction. The risk assessment and SWPPP must be prepared by a State-Qualified SWPPP Developer (QSD). In addition, the SWPPP must contain a visual monitoring program, a chemical monitoring program for non-visible pollutants, and a sediment monitoring plan if the site discharges directly to a water body listed on the 303(d) list for sediment.

The Construction General Permit requires that construction sites be assigned a risk level of 1 (low), 2 (medium), or 3 (high), based both on the sediment transport risk at the site and the risk to receiving waters during periods of soil exposure (e.g., grading and site stabilization). The sediment risk level reflects the relative amount of sediment that could be discharged to receiving water bodies, and is based on the nature of the construction activities and the location of the site relative to receiving water bodies. The receiving-waters risk level reflects the risk to receiving waters from the sediment discharge. Depending on the risk level, construction projects governed by the Construction General Permit could be subject to the following best management practice requirements (BMPs): Effluent standards; good site management "housekeeping;" non-stormwater management; erosion and sediment controls; run-on and runoff controls; inspection, maintenance, and repair; and monitoring and reporting requirements. Such BMPs are designed to protect surface water quality by preventing eroded soil and construction-related pollutants from migrating off-site from the construction area. Routine inspection of all BMPs is required under the Construction General Permit.

Local

Shasta County General Plan

Multiple elements of the Shasta County General Plan discuss and prioritize considerations of water resources. Water supply, flooding, water quality, erosion, dam safety and inundation are

key areas of hydrological consideration in the General Plan. The following objectives and policies pertain to a consideration of hydrology and water quality (Shasta County, 2004).

5.1 Seismic and Geologic Hazards

***SG-4*:** Protection of waterways from adverse water quality impacts caused by development on highly erodible soils.

***SG-d*:** Shasta County shall develop and maintain standards for erosion and sediment control plans for new land use development. Special attention shall be given to erosion prone hillside areas, including those with extremely erodible soils types such as those evolved from decomposed granite.

5.2 Flood Protection

***FL-2*:** Protection of public health and safety, both on-site and downstream, from flooding through floodplain management which regulates the types of land uses which may locate in the floodplain, prescribes construction designs for floodplain development, and requires mitigation measures for development which would impact the floodplain by increasing runoff quantities.

6.6 Water Resources

***W-9*:** Institute effective measures to protect groundwater quality from potential adverse effects of increased pumping or potential sources of contamination.

***W-a*:** Sedimentation and erosion from proposed developments shall be minimized through grading and hillside development ordinances and other similar safeguards as adopted and implemented by the County.

***W-b*:** Septic systems, waste disposal sites, and other sources of hazardous or polluting materials shall be designed to prevent contamination to streams, creeks, rivers, reservoirs, or groundwater basins in accordance with standards and water resource management plans adopted by the County.

***W-c*:** All proposed land divisions and developments in Shasta County shall have an adequate water supply of a quantity and a quality for the planned uses. Project proponents shall submit sufficient data and reports, when requested, which demonstrate that potential adverse impacts on the existing water users will not be significant. The reports for land divisions shall be submitted to the County for review and acceptance prior to a completeness determination of a tentative map. This policy will not apply to developments in special districts which have committed and documented, in writing, the ability to provide the needed water supply.

3.12.2 Significance Criteria

CEQA Guidelines Appendix G Section X identifies considerations relating to hydrology and water quality. See Section 3.1.4, *Environmental Considerations Unaffected by the Project or Not Present in the Project Area*, as it relates to the County's analysis of the potential impacts of this Project to the considerations suggested in CEQA Guidelines Appendix G Section X. Otherwise, for purposes of this analysis, a project would result in a significant impact to Hydrology or Water Quality if it would:

a) Violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality;

b) Substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin;

c) Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would:

   i. Result in substantial erosion or siltation on- or off-site;

   ii. Substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite;

   iii. Create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or

   iv. Impede or redirect flood flows; or

d) Conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Neither the Project nor alternatives would have any impact relating to flood hazard, tsunami, or seiche zones, risk release of pollutants due to project inundation. See Section 3.1.4, *Environmental Topics Removed from Consideration*, for details.

3.12.3 Direct and Indirect Effects

3.12.3.1 Methodology

The analysis conservatively assumes that all areas of temporary and permanent disturbance, identified in Table 2-1 would, to varying degrees, alter the hydrology of the Project Site. The analysis includes all phases of the Project: site clearing, construction, operation and maintenance, as well as decommissioning, and associated site reclamation following the anticipated 40-year term of the use permit.

3.12.3.2 Direct and Indirect Effects of the Project

a) Whether the Project would violate any water quality standards or waste discharge requirements or otherwise substantially degrade surface or ground water quality.

Impact 3.12-1: The Project would, unless mitigated, violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality during construction and decommissioning. (*Less than Significant with Mitigation Incorporated*)

Construction

Whether a discharge of waste would adversely affect the quality of the waters of the state depends on various factors including distribution and sensitivity of the beneficial uses of water; presence

of domestic water supplies and aquatic species; proximity of operations to other critical beneficial uses; current water quality conditions including existing TMDL or 303(d) listings; erodible soils and topography; and presence of any post fire landscapes, evaluated against the type and scope of proposed activities.

Construction associated with the Project would be subject to water quality policies and standards identified in the Basin Plan and waste discharge requirements pursuant to RWQCB General Order Number R5-2017-0061 for proposed timber harvest activities. Waste discharge requirements would be implemented, as required, along with their associated compliance conditions, which could include establishing equipment limitation zones near watercourses, installation of and/or protective structures for culverts at stream crossings; and retention of riparian vegetation along waterways and wetlands, and restrictions on pesticide use near water courses, among others. The Project would be constructed in a manner that would minimize hill cuts and other actions that could generate unchecked conditions of erosion, runoff, and associated water quality violations. The Project design would be further refined and ultimately finalized based on conditions of specific permits and other authorizations if the Project is approved.

Beneficial uses of waters in the vicinity of the Project (as identified in the Basin Plan and listed in Table 3.12-1) include municipal water supply, recreation, freshwater and wildlife habitat, among others. Project construction activity would involve soil disturbances that could temporarily generate erosion and/or sedimentation causing exceedances of state or federal water quality standards, or impact beneficial uses for receiving waters. Site clearing, soil disturbance, removal of vegetation, and timber harvesting, and surface water diversions associated with access road construction, and installation of the on-site septic system as well as other construction activities have the potential to substantially degrade surface and groundwater quality within the Project Site. Such effects could extend to the surrounding watersheds.

As detailed in Table 2-1, construction of Project components would include widening and development of access roads; clearing and grading for turbine pads; work footprints for electrical collector systems; substation, O&M building equipment areas and staging areas. Temporary disturbance associated with these activities has been estimated to include an area of up to 1,384 acres. Water quality impacts associated with soil disturbances would vary depending on proximity to waterways, types of disturbances, and impact avoidance and minimization measures intended and implemented to protect surface water and groundwater quality. The Project's internal access/circulation road construction north of SR 299 would be in very close proximity to a 2-mile reach of Little Hatchet Creek. Thus grading activity during construction could result in significant sedimentation of this waterway within the upper Hatchet Creek watershed. The Project would include a relatively high number of turbines within the Upper Montgomery Creek watershed; thus, temporary and permanent impacts associated with construction of turbine pads and access roads would be higher within this watershed than in other watershed areas affected. To reduce direct impacts to waters and wetlands, mitigation measures (such as Mitigation Measure 3.4-15a) would be implemented as described in Section 3.4, *Biological Resources*. This mitigation measure includes specific provisions for marking locations of wetlands, waterways, and wells that could be affected by the Project and procedures for establishing buffers for the protection of aquatic resources.

Consistent with requirements of the Construction General Permit, a SWPPP and a Temporary Erosion and Sediment Control (TESC) plan, containing site-appropriate BMPs consistent with the requirements of the Forest Practice Rules as well as the recommendations of the California Association of Stormwater Quality Agencies (CASQA), would be implemented to limit potential water quality contamination. Temporary and permanent measures would be installed to protect stormwater conveyance infrastructure. Measures could include engineered erosion control devices such as silt fences and straw wattles (along contours) and interceptors at culverts and stormwater inlets to limit delivery of silt, sediment, and stormwater contaminants into receiving waters. The TESC would stipulate appropriate intervals to monitor and adjust BMPs to ensure that measures perform as designed.

Construction activities and other Project phases may involve the transportation, use, or storage of a variety of hazardous materials, that in the absence of appropriate procedures, could compromise the water quality of surface and groundwater. However, as discussed in the Project Description (Section 2.4.8.3, *Hazardous Materials*) and in Section 3.11, *Hazards and Hazardous Materials*, the Project would prepare a Hazardous Materials Business Plan (HMBP) which would include a Spill Prevention Control and Countermeasures Plan (SPCC) prior to construction. The HMBP would include BMPs for the transport, storage, use, and disposal of hazardous materials and waste. The HMBP would also include information regarding construction activities, worker training procedures, and hazardous materials inventory procedures. The Applicant further proposes as part of the Project that all equipment would be maintained in good working condition, and free of leaks; all vehicles would be equipped with drip pans during storage to contain minor spills and drips; no refueling or storage would take place within 100 feet of a drainage channel; spill kits would be located onsite and in vehicles for use in spill response; and crews working with heavy equipment would be trained in spill containment and response.

Even with implementation of a SWPPP, HMBP/SPCC, and associated BMPs, given the Project's location and scale of soil disturbing activities proposed to occur in close proximity to waterways, the Project could violate water quality standards through the contribution of contaminants to waterways during construction. This would be a significant impact. To reduce this potential significant effect on water quality, Mitigation Measure 3.12-1, Water Quality Best Management Practices during Activities in and near Water, would be implemented during construction.

Operation and Maintenance

For purposes of this analysis, permanent disturbance would occur in those areas that would remain cleared and in use throughout Project operations, regardless of whether they are returned to original use after decommissioning. The total area of permanent disturbance for the Project has been estimated to include up to 713 acres of land, as quantified in Table 2-1.

Operation of the Project would include an on-site septic system as part of the O&M Building facility. Unless properly sited, designed and operated, the proposed septic system could degrade surface or groundwater. A Shasta County septic permit and review and clearance from the Shasta County Office of Environmental Health would be required to permit this facility. Adherence to these County permit requirements would ensure that the septic system would have a less-than-significant impact on water quality.

For the Project's operational phase, the Applicant would prepare and implement a HMBP (including operational BMPs) with information about the types of hazardous materials that would be used during operation and maintenance of the Project. The HMBP also would include spill prevention and spill response measures to ensure that in the event of an unlikely release, the area affected is swiftly contained and minimized. Permanent erosion control measures (installed at the time of construction) would be maintained to protect access roads, culverts, and stormwater infrastructure throughout the life of the Project. With implementation of the HMBP, operation and maintenance of the Project would not violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality during construction. A less-than-significant impact would result during this phase of the Project.

Decommissioning

Following the anticipated 40-year term of the requested conditional use permit, the Project's above-ground components would be dismantled and the site would be restored generally to pre-Project conditions. Removal of Project components would include ground disturbance, including to excavate turbine and structure foundations to a depth of approximately 3 feet below grade. The types of equipment and vehicles necessary to decommission the Project would be generally similar to the requirements for construction. In areas where trees and vegetation were removed, replanting would occur. Given the Project's location in close proximity to multiple waterways and proposed activities that would disturb soil and potentially convey contaminants to these waterways, decommissioning of the Project could violate water quality standards. To reduce this potential significant effect to water quality, Mitigation Measure 3.12-1, Water Quality Best Management Practices during Activities in and Near Water, would be implemented during construction and decommissioning.

Mitigation Measure 3.12-1: Water Quality Best Management Practices during Activities in and near Water.

To avoid and/or minimize potential impacts on water quality (and jurisdictional waters) during construction- and decommissioning-related project activities that would be conducted near (i.e., within 50 feet), in, or over waterways, the project contractor shall implement the following standard construction BMPs to prevent releases of hazardous materials and to avoid other potential environmental impacts:

1. In-stream construction shall be scheduled during the summer low-flow season to minimize impacts on aquatic resources. If instream construction takes place during higher flow seasons, the following measures shall be implemented:
    a. Minimize mechanized equipment use below top of bank of streams;
    b. Perform activities in accordance with all permit conditions and best practices; and
    c. Have environmental monitors on-site to monitor instream construction to ensure compliance with permit conditions and best practices.
2. All construction material, wastes, debris, sediment, rubbish, trash, etc., shall be removed from the Project Site daily during construction and decommissioning, and

thoroughly at the completion of each of these phases. Debris shall be transported to an authorized upland disposal area.

3. Consistent with the Project's Hazardous Materials Business Plan (HMBP) and Spill Prevention Control and Countermeasures Plan (SPCC), construction workers shall receive training prior to construction/decommissioning and protective measures shall be implemented to prevent accidental discharges of oils, gasoline, or other hazardous materials to jurisdictional waters during fueling, cleaning, and maintenance of equipment, as outlined in the Project's HMBP. Equipment used to perform construction work on the Project Site shall be maintained in accordance with manufacturers' protocols, and, except in the case of failure or breakdown, equipment maintenance shall be performed off-site. Crews shall check heavy equipment daily for leaks; if a leak is discovered, it shall be immediately contained and use of the equipment shall be suspended until repaired. The source of the leak shall be identified, material shall be cleaned up, and the cleaning materials shall be collected and properly disposed.

4. Vehicles and equipment shall be serviced off-site, or, if on-site service is necessary, in a designated location a minimum distance of 100 feet from drainage channels and other waterways. Fueling locations shall be inspected after fueling to document that no spills have occurred. Any spills shall be cleaned up immediately.

Significance after Mitigation: Less than significant.

Impact 3.12-2: Blasting, if it occurs, could substantially degrade groundwater quality. (*Less than Significant with Mitigation Incorporated*)

As proposed, the Project could include blasting prior to trenching or excavating in rocky areas. If blasting is necessary, the Applicant would prepare a Blasting Plan that identifies the locations where blasting is anticipated to be needed, all applicable regulations governing the activity, the times and distances where explosives would be permitted, and a commitment to notify the County and emergency responders at least 24 hours in advance of blasting. Nonetheless, if it occurs, blasting could result in the release of a regulated or unregulated substance to the groundwater (e.g., by spilling or releasing chemicals from blasting materials) or could result in potential impacts to state or private water supplies by causing the subsurface fracturing of volcanic rock and alteration of hydrological conditions for adjacent aquifers. Blasting also could cause a shaking loose of silt, rock, or other particles that line fracture surfaces in the subsurface and, thereby result in increased turbidity in well water. Should they occur, a significant adverse impact to groundwater would result. As described in Section 3.4, *Biological Resources*, Mitigation Measure 3.4-15a would be implemented, which includes measures to protect aquatic resources. In addition to these measures and to reduce this potentially significant effect, Mitigation Measure 3.12-2, *Best Management Practices for Blasting*, also would be implemented.

Mitigation Measure 3.12-2: Best Management Practices for Blasting.

All activities related to blasting shall follow Best Management Practices (BMPs) to prevent contamination of groundwater including preparing, reviewing and following an approved blasting plan; proper drilling, explosive handing and loading procedures;

observing the entire blasting procedures; evaluating blasting performance; and handling and storage of blasted rock.

(1) ***Blasting Plan.*** Prior to conducting the first blast on the Project Site, the Applicant shall prepare and submit a detailed blasting plan to the Shasta County Department of Resource Management and the Shasta County Sheriff's Department. The blasting plan shall contain a complete description of how explosives will be safely transported and used at the site; evacuation, security and fire prevention procedures; blasting equipment list; and procedures for notification of nearby receptors. The blasting plan shall explain how the Applicant will comply with the requirements of 30 CFR §§816.61 through 816.68 regarding the use of explosives to be consistent with the technical requirements of the statute. Procedures for notification shall include, but not be limited to, the following:

a. At least 30 days before initiation of blasting, the operator shall notify, in writing, all residents or owners of dwellings or other structures located within 0.5-mile of the permit area describing how to request and submit a pre-blasting survey. Notification shall include posting a written notice within the Project Site, and on the County's public website describing how to obtain and submit a pre-blasting survey.

b. A resident or owner of a dwelling or structure within 0.5 mile of any part of the permit area may request a pre-blasting survey. This request shall be made, in writing, directly to the operator or to the regulatory authority, who shall promptly notify the operator. The operator shall promptly conduct a pre-blasting survey of the dwelling or structure and promptly prepare a written report of the survey detailing the results.

c. The operator shall determine the condition of the dwelling or structure and shall document any pre-blasting damage and other physical factors that could reasonably be affected by the blasting. Structures such as pipelines, cables, transmission lines, and cisterns, wells, and other water systems warrant special attention; however, the assessment of these structures may be limited to surface conditions and other readily available data.

d. Prior to finalizing the blasting plan, the County or designated operator shall consult with jurisdictional authorities tasked with protecting waters of the state and implement avoidance and minimization measures, as required by CDFW, USACE, and regional water quality (Section 401) regulatory permits prepared for the Project. Such protective measures shall be included in the blasting plan and/or incorporated by reference.

(2) ***Loading practices.*** The following blast hole loading practices to minimize environmental effects shall be followed:

a. Drilling logs shall be maintained by the driller and communicated directly to the blaster. The logs shall indicate depths and lengths of voids, cavities, and fault zones or other weak zones encountered as well as groundwater conditions.

b. Explosive products shall be managed on-site so that they are either used in the borehole, returned to the delivery vehicle, or placed in secure containers for off-site disposal.

c. Spillage around the borehole shall either be placed in the borehole or cleaned up and returned to an appropriate vehicle for handling or placement in secured containers for off-site disposal.

d. Loaded explosives shall be detonated as soon as possible and shall not be left in the blast holes overnight, unless weather or other documented safety concerns reasonably dictate that detonation should be postponed.

e. Loading equipment shall be cleaned in an area where wastewater can be properly contained and handled in a manner that prevents release of contaminants to the environment.

f. Explosives shall be loaded to maintain good continuity in the column load to promote complete detonation. Industry accepted loading practices for priming, stemming, decking and column rise shall be attended to.

(3) ***Explosive Selection.*** To reduce the potential for groundwater contamination when explosives are used, explosive products shall be selected that (a) are appropriate for site conditions and safe blast execution, and (b) have the appropriate water resistance for the site conditions present to minimize the potential for hazardous effect of the product upon groundwater.

(4) **Prevention of Misfires.** Appropriate practices shall be developed and implemented to prevent misfires.

(5) **Blast Rock Pile Management.** To reduce the potential for contamination, the interaction of blasted rock piles and stormwater shall be managed to prevent contamination of water supply wells or surface water.

Significance after Mitigation: Less than significant.

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b) Whether the Project would substantially decrease groundwater supplies or interfere substantially with groundwater recharge such that the project may impede sustainable groundwater management of the basin.

Impact 3.12-3: The Project could decrease groundwater supplies or interfere with groundwater recharge such that the project may impede sustainable groundwater management of the basin. (*Less-than-Significant Impact*)

The Project has the potential to directly and indirectly affect groundwater supplies during construction through use of groundwater for dust suppression and other subsurface disturbances. Direct impacts could include groundwater use potentially placing substantial demands on available supplies. Other considerations raised during the Project's scoping period suggested that alteration to subsurface hydrology could occur with excavation, which could impact groundwater. The Project would require excavation to a depth of 10 to 15 feet to support the turbine pedestals and excavation for a foundation depth of 40 feet to support the Project's microwave tower structure at the switching station. Groundwater levels for wells in the vicinity of the Project's switching station range from 87 to 155 feet below ground surface, so it is unlikely that the depth

of excavation required for construction of the Project would impact these groundwater resources nor alter groundwater flow patterns (DWR, 2020a).

Regarding potential impacts to groundwater supplies, the Project would require up to 49 acre-feet of water for site clearing and construction and 5.6 acre-feet of water per year for operation and maintenance. To put this in context, the Project's annual water requirements for operation and maintenance would be roughly equivalent to annual domestic water use for 22.6 households in California.[1] During both construction and operation and maintenance, water either would be provided from onsite well(s) or would be delivered by a contractor using water trucks from an existing water right. The expected source of offsite water, if used, is the Burney Water District. Because District supplies are sourced from groundwater (Environmental Working Group, 2020), this analysis assumes that all water to supply the Project would come from groundwater. The water supply assessment prepared for the Project (see **Appendix I**) determined that the potential impact of the Project's water demand (with respect to groundwater supply) would be negligible and represents a *de minimis* use of groundwater compared to existing production capacity. Because groundwater basins within Shasta County are not overdrafted, and because the Project's demand, if sourced from the Burney Water District, would represent a small fraction (approximately 7.6 percent) of the overall withdrawal from the Burney Creek Valley Groundwater Basin (estimated to be about 643 acre-feet per year per DWR, 2020c), it is expected that the Project would not substantially decrease groundwater supplies such that the Project could impede sustainable groundwater management of the basin. Therefore, the impact associated with construction would be less than significant.

Operation and Maintenance

Human activity can affect groundwater recharge potential by limiting the percolation of surface water through the ground to an aquifer or by removing water from an aquifer via wells. Here, the Project would increase impervious surfaces or otherwise limit groundwater recharge potential within the Project Site by constructing turbine pads, foundations, roads, and the other components identified in Table 2-1, *Project Components and Disturbance Areas*, that could compact soils or replace soil with concrete so as to preclude percolation of surface waters in the areas where they are proposed. However, given the limited ground surface, and the limited amount of development in the vicinity that would be affected by the Project (see Figure 3.12-1), it is expected that the Project would not interfere substantially with groundwater recharge such that the Project could impede sustainable management of the groundwater basin. Therefore, the impact would be less than significant.

As described in Section 2.4.8, operation and maintenance of the Project would require an estimated 5,000 gallons per day for the 40-year duration of the requested conditional use permit to serve the water needs for the O&M facility and to fill an onsite water tank for emergency fire protection. This limited demand is less intense from year to year than would be generated during construction, and would cause a less-than-significant impact.

[1] This estimate is based on a California per capita average water use of 85 gallons per day, with 2.6 persons per household.

Decommissioning and Site Reclamation

Decommissioning and Site Reclamation would utilize water resources only for fire protection and dust control and would be a temporary demand. For the same reasons discussed in the context of construction, the Project would not have a significant impact on groundwater resources during decommissioning and site reclamation.

Mitigation: None required.

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c) Whether the Project would substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river or through the addition of impervious surfaces, in a manner which would: i) Result in substantial erosion or siltation on- or off-site; ii) substantially increase the rate or amount of surface runoff in a manner which would result in flooding on- or offsite; iii) create or contribute runoff water which would exceed the capacity of existing or planned stormwater drainage systems or provide substantial additional sources of polluted runoff; or iv) impede or redirect flood flows.

Impact 3.12-4: The Project would, unless mitigated, substantially increase siltation of waterways or provide substantial additional sources of polluted runoff during construction and decommissioning. (*Less than Significant with Mitigation Incorporated*)

Site Clearing

The Project is designed in a manner to maintain onsite surface drainage patterns to the extent possible. The Project's access roads would be designed to follow natural contours and minimize hill cuts. However, some alteration of contours may be required which could change drainage patterns and result in localized erosion, siltation, and/or runoff. As described in the aquatic resources delineation prepared for the Project, it is anticipated that the construction of the Project would impact wetlands, marshes, intermittent, ephemeral and perennial streams in the survey area. The Project would include clearing of vegetation, tree removal and other soil disturbing activities as summarized in Table 2-1, *Project Components and Disturbance Areas*. Cleared turbine pad sites with 2-acre buffers would be established involving tree removal and replacement with low-growing vegetation. Up to 72 turbines would be installed on constructed spread footing foundations requiring 10-15 feet of subsurface excavation. The Project's construction, at the initiation of site clearing or soil disturbing activities, would require coverage under the Construction General Permit and would include implementation of a SWPPP, and associated BMPs to limit erosion and runoff. Project Site preparation and construction also would be subject to federal and State jurisdiction under Sections 401 and 404 of the federal CWA. Therefore, implementing the Project would require a CWA Section 404 permit from USACE and a Water Quality Certification from the Central Valley RWQCB. Additionally, as described in the regulatory setting, coverage under the General Order for Timber Management Activities would include compliance conditions to limit impacts to surface waters.

Construction

The Project includes improvement (widening) and use of existing logging roads, as well as construction of new graded and graveled access roads, as depicted in Figure 2-5, *Road Network*.

Construction of access roads would alter terrain to enable initial transport of turbine blades and other components. Although roads would be designed and graded to align with the natural contours, and stormwater drainage infrastructure (i.e., upgraded culverts) would be installed to minimize impacts associated with access road construction, soil disturbing activities would have the potential to substantially degrade water quality as sediment and other pollutants could be delivered to waterways through stormwater runoff. Widening of roads, grading, and compaction also could alter drainage patterns and increase the rate and volume of surface runoff.

In addition to access roads, the Project's construction would include construction of pads or foundations for turbines, electrical infrastructure including a substation, operation and maintenance building, METs, parking areas, and other developments to support the overall energy generation facilities. The construction of these Project components would be required to adhere to the SWPPP and TESC, such that erosion control, good housekeeping, and other BMPs would be comprehensively applied as part of construction. As described under question a), the HMBP and SPCC would provide measures to intercept oils, fuels, and other potential contaminants, acting as an effective form of source control during all phases of construction. Similar to impacts identified in question a), with implementation of Mitigation Measure 3.12-1 (Water Quality Best Management Practices during Activities in and near Water) and measures required for the Construction General Permit, the SWPPP, the TESC, and the interception of pollutants through the HMBP and SPCC, impacts would be reduced to less-than-significant levels.

Operation and Maintenance

Access roads, graded and widened as part of the Project, would facilitate long-term maintenance of the Project's wind energy generation facilities. Access roads, as part of these facilities, also would require monitoring and periodic maintenance, such as grading, replacement of gravel for road surfaces. Seasonal monitoring and maintenance of culverts and storm drains also may be required to ensure functionality and limit erosive conditions on site. Culverts at stream crossings would be sized to allow for conveyance of a 100-year storm event without increasing average flow velocity or bed/bank scour potential.

The construction of the turbine pads would introduce new impervious surfaces; however, they would be required to include grading and erosion control requirements in accordance with Shasta County Code, Chapter 12.12 which includes grading requirements (under Section 2, Chapter 15.08.110) for the prevention of sedimentation and damage to off-site property. Pursuant to Section 4, Chapter 15.13.040, a detailed grading and drainage plan also would be required. In addition, these pads, relative to the entire Project Site, would represent a relatively small portion of the site. Therefore, considering the spacing and size, the runoff produced from the pads would be controlled by drainage control improvements and would not concentrate flows such that there would be a substantial increase in erosion, runoff volumes, or flooding potential. Therefore, the proposed increase in impervious surfaces while changing drainage patterns, would not adversely affect receiving waters in water quality, runoff volumes, or impede flood flows. The potential impact would be less than significant.

As noted in Table 2-3, *Hazardous Materials*, herbicides may be utilized for fire safety purposes to control vegetation around Project facilities. Herbicides would be applied in a manner consistent

with product labels, consistent with state (DPR) and federal requirements. See, e.g., Potential impacts of herbicide use to human health are analyzed in Section 3.11, *Hazards and Hazardous Materials*.

Decommissioning

At the conclusion of the Project's term of use, decommissioning would include removal of constructed elements along with some degree of land-disturbing activity. Disturbed areas would be restored to preconstruction conditions (as stated in Section 2.4.7, *Decommissioning and Site Restoration*). Subsurface elements of the project, stormwater drainage facilities would remain on site to ensure that built access roads remain in a condition to allow for appropriately managed drainage.

> **Mitigation Measure 3.12-4:** Implement the water quality best management practices during activities in and near water that would be required by Mitigation Measure 3.12-1.
>
> **Significance after Mitigation:** Less than significant.

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d) Whether the Project would conflict with or obstruct implementation of a water quality control plan or sustainable groundwater management plan.

Impact 3.12-5: The Project would, unless mitigated, conflict with implementation of the Central Valley Basin Plan. (*Less than Significant with Mitigation Incorporated*)

The Project Site is not located in a defined groundwater basin, nor is there a groundwater management plan in place or proposed that would be applicable to the Project. With protection measures described as follows, surface and groundwater resources would not become compromised. As discussed in the context of Impact 3.12-1, the Basin Plan identifies numerous beneficial uses of waterways that cross through the Project Site. With implementation of protective erosion control measures defined in the TESC and the SWPPP (as part of the Construction General Permit); source control measures outlined in the HMBP/SPCC; and Mitigation Measure 3.12-1 (Water Quality Best Management Practices during Activities in and near Water) and, if blasting occurs, Mitigation Measure 3.12-2 (Best Management Practices for Blasting), the Project would not conflict with implementation of the Basin Plan.

> **Mitigation Measure 3.12-5a:** Implement the water quality best management practices during activities in and near water that would be required by Mitigation Measure 3.12-1.
>
> **Mitigation Measure 3.12-5b:** Implement the best management practices for blasting that would be required by Mitigation Measure 3.12-2.
>
> **Significance after Mitigation:** Less than significant.

3.12.3.3 PG&E Interconnection Infrastructure

The Project would include interconnection infrastructure as described in Section 2.4.3, *Project Substation, Switching Station and Interconnection Facilities*. Construction and decommissioning of the proposed PG&E infrastructure would require ground disturbance that could affect surface and groundwater, and may require blasting to accommodate rocky terrain. With the implementation of Mitigation Measures Mitigation Measure 3.12-1 (Water Quality Best Management Practices during Activities in and near Water) and Mitigation Measure 3.12-2 (Best Management Practices for Blasting), impacts of the PG&E infrastructure would be less than significant.

3.12.3.4 Direct and Indirect Effects of Alternatives

Alternative 1: South of SR 299

Under Alternative 1, no turbines would be erected north of SR 299. Thus, Alternative 1 would avoid all impacts to Little Hatchet Creek and most disturbance-related impacts to the main stem of Hatchet Creek. There would be an overall reduced acreage of temporary and permanent disturbance, limited to a footprint defined in a smaller area with fewer turbines compared to the Project. However, Alternative 1 would still have potentially significant impacts and thus would require implementation of the same mitigation measures to reduce direct and indirect impacts associated with hydrological disturbance and runoff. Consistent with baseline conditions, it is expected that, under Alternative 1, timber harvesting activities would continue to occur in areas north of SR 299, along with the associated disturbance from active forest management of these lands.

Alternative 2: Increased Setbacks

Under Alternative 2, there would be fewer turbines reducing overall temporary (construction-related) and permanent disturbance. However, potential impacts to Little Hatchet Creek and other surface waters and groundwater would be substantially similar to those described for the Project. Alternative 2 would require implementation of the same protective measures and mitigation.

No Project Alternative

If the No Project Alternative is implemented, none of the proposed wind project infrastructure would be constructed, operated and maintained, or decommissioned on the Project Site. No new roads would be constructed and none of the existing roads would be improved. No stream crossings or other work near surface waters would occur, no grading or other surface preparation work would occur, no wells would be installed, and the existing permeability of on-site soils would remain unchanged. No surface or groundwater would be used for Project purposes. No Project-related vehicles or equipment would be present on the site. The Project Site would continue to be operated as managed forest timberlands. Because there would be no change relative to baseline conditions, the No Project Alternative would create no impact related to Hydrology or Water Quality.

The Project Site is zoned for timber production. Pursuant to regulations implementing the California Timberland Productivity Act (Government Code §51100 et seq.; 14 Cal. Code Regs. §897[a]), there is a legal presumption that "timber harvesting is expected to and will occur on such lands." The regulations further specify that timber harvesting on such lands "shall not be presumed to have a Significant Adverse Impact on the Environment" (14 Cal. Code Regs. §898). Therefore, the No Project Alternative, including anticipated timber harvesting, is not presumed to result in a significant adverse individual or cumulative effect to Hydrology or Water Quality. CAL FIRE would review any future timber harvesting proposal to evaluate any potential project-specific, site-specific environmental impacts.

3.12.4 Cumulative Analysis

The geographic scope of analysis of cumulative effects includes the Project Site, affected waterways, and surrounding watersheds and aquifers potentially impacted by site clearing, construction, operation and maintenance, and decommissioning of the Project. Consideration of the cumulative scenario includes effects of past projects such as legacy land management and timber harvesting within and surrounding the Project Site, as well as current and reasonably foreseeable activities that similar to the Project, have an influence on land contours and hydrological issues across the landscape. This analysis considers the incremental effects of the Project to determine whether, when added to the effects of other projects in the cumulative scenario, would cause or contribute to significant cumulative effects.

The temporal scope of a consideration of incremental construction-related Project effects is assumed to include the initiation of site clearing and soil disturbing activities within the 18- to 24-month time frame for construction (prior to Project operation). The temporal scope for a consideration of operation and maintenance related activities is assumed to be the life of the Project, or the 40-year duration of the requested conditional use permit. This analysis also considers cumulative effects of decommissioning and site restoration for a period of 18 to 24 months.

As described in Section 3.1.2, there are numerous timber management activities and three large-scale projects on Federal lands surrounding the Project, involving tree mortality and removal in response to California's recent drought, climate change, and wildfire conditions. Effects of these activities, though intended for purposes of forest restoration, are likely to include soil disturbance, erosion, hydrological alteration, as well as impacts to water quality for the creeks and streams that cross through the mountainous landscape. Other wind generation development, notably the Hatchet Ridge Wind Project, included alteration of site contours, construction of access routes, erection of wind turbine generators and other soil disturbing activities on a similar scale, with impacts determined to be less than significant with mitigation implemented within 1 mile of the Project Site. \Moreover, scoping comments suggest that the remote location of the proposed site is one that is likely to include cannabis cultivation projects that could impact water quality by introducing pesticides and other contaminants to the watersheds through unregulated methods.

Such projects and associated site alterations and impacts, even those considered to be less than significant, when considered in combination with the Project's potential effects on hydrology and water quality could result in an impact that would be considered cumulatively significant. Because the Project's incremental impacts would be reduced through implementation of various measures to protect waterways and water quality through compliance with water quality standards or waste discharge requirements and best management practices (see Mitigation Measures 3.12-1 and 3.12-2), when considered in combination with the effects of other projects, including presumed projects that employ unregulated hydrology and water quality practices, the Project's incremental contribution to potential significant cumulative effect would not be cumulatively considerable.

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3.13 Noise and Vibration

This section identifies and evaluates issues related to Noise and Vibration in the context of the Project and alternatives. It includes information about the physical and regulatory setting and identifies the criteria used to evaluate the significance of potential impacts, the methods used in evaluating these impacts, and the results of the impact assessment. The information and analysis presented in this section are based in part on data provided in **Appendix G**, *Noise and Vibration*. The County independently reviewed this and other materials prepared by or on behalf of the Applicant and determined them to be suitable for reliance on (in combination with other materials included in the formal record) in the preparation of this EIR.

In response to its notice of intention to prepare this Draft EIR, the County received scoping input about residents in Moose Camp who could be affected by increased noise and vibration during the Project's construction, operation, and maintenance. Comments suggested that noise could result from additional vehicles traveling along the main road proposed between the two substations (which would abut residential property) and along the three roads that surround Moose Camp's fence line, from heavy equipment and from the proposed concrete batch plant; from operation of the turbines (including low-frequency sonic and infrasonic noise caused by the blades combined with the creaking and groaning of the structures) and from operation of the power lines (described in scoping comments as the "hissing sound," "constant buzz" and "sizzle and pop" audible in winter or when it is cold or moist). Vibration, scoping comments suggested, could be caused by operation of the turbines. All scoping input received, including regarding noise and vibration, is provided in Section 4.1 of the Scoping Report, a copy of which is provided in **Appendix J**, *Scoping Report*.

3.13.1 Setting

3.13.1.1 Study Area

The study area for evaluation of noise and vibration impacts from construction and decommissioning activities encompasses the Project Site and the nearest potentially affected sensitive receptors to the proposed work. A maximum potential impact distance of 5,000 feet (approximately 1 mile) without mitigation was established based on maximum noise level potential as described in Section 3.13.3, *Direct and Indirect Effects*. The study area for evaluation of construction vibration impacts was established by considering a worst-case daytime construction vibration level from blasting and the most restrictive threshold applicable to historic structures, which results in a distance of 4,000 feet without mitigation.

The study area for evaluation of operational noise and vibration impacts encompasses the Project Site and receptors up to 2 miles away from proposed turbines as well as receptors within 500 feet of roadways used to access the Project Site based on the attenuation of traffic noise with distance to background levels.

3.13.1.2 Environmental Setting

Technical Background

Sound is mechanical energy transmitted by pressure waves through a medium such as air. Noise is defined as unwanted sound. Sound is characterized by various parameters that include the rate of oscillation of sound waves (frequency), the speed of propagation, and the pressure level or energy content (amplitude). In particular, the sound pressure level has become the most common descriptor used to characterize the "loudness" of an ambient sound level. Sound pressure level is measured in decibels (dB), with 0 dB corresponding roughly to the threshold of human hearing, and 120 to 140 dB corresponding to the threshold of pain.

Sound pressure fluctuations can be measured in units of hertz (Hz), which correspond to the frequency of a particular sound. Typically, sound does not consist of a single frequency, but rather a broad band of frequencies varying in levels of magnitude (sound power). The typical human ear is not equally sensitive to all frequencies of the audible sound spectrum. As a consequence, when assessing potential noise impacts, sound is measured using an electronic filter that de-emphasizes the frequencies below 1,000 Hz and above 5,000 Hz in a manner corresponding to the human ear's decreased sensitivity to low and extremely high frequencies. This method of frequency weighting is referred to as A-weighting and is expressed in units of decibels (dBA).[1] Frequency A-weighting follows an international standard methodology of frequency de-emphasis and is typically applied to community noise measurements.

Some representative noise sources and their corresponding A-weighted noise levels are shown in **Table 3.13-1**. Alternatively, the *C-weighted sound level (dBC)* also follows the frequency sensitivity of the human ear, but at much higher noise levels. This results in a flatter curve giving more emphasis to low frequency sounds. C-weighting is only used in special cases when low frequency noise is of particular importance.

TABLE 3.13-1
TYPICAL NOISE LEVELS

Noise Level (dBA)	Outdoor Activity	Indoor Activity
90+	Gas lawn mower at 3 feet, jet flyover at 1,000 feet	Rock Band
80-90	Diesel truck at 50 feet	Loud television at 3 feet
70-80	Gas lawn mower at 100 feet, noisy urban area	Garbage disposal at 3 feet, vacuum cleaner at 10 feet
60-70	Commercial area	Normal speech at 3 feet
40-60	Quiet urban daytime, traffic at 300 feet	Large business office, dishwasher next room
20-40	Quiet rural, suburban nighttime	Concert hall (background), library, bedroom at night
10-20	Remote open space	Broadcast / recording studio
0	Lowest threshold of human hearing	Lowest threshold of human hearing

SOURCE: Modified from Caltrans, 2013a

[1] All noise levels reported herein reflect A-weighted decibels unless otherwise stated.

Noise Exposure and Community Noise

An individual's noise exposure is a measure of the noise experienced by the individual over a period of time. A noise level is a measure of noise at a given instant in time. The noise levels presented in Table 4.11-1 represent noise measured at a given instant in time; however, noise levels rarely persist consistently over a long period of time. Rather, community noise varies continuously over time because of the contributing sound sources of the community noise environment. Community noise is primarily the product of many distant noise sources, which constitute a relatively stable background noise, with the individual contributors unidentifiable. The background noise level changes throughout a typical day, but does so gradually, corresponding with the addition and subtraction of distant noise sources such as traffic and wind. What makes community noise constantly variable throughout a day, besides the slowly changing background noise, is the addition of short duration single event noise sources (e.g., aircraft flyovers, motor vehicles, sirens), which are readily identifiable to the individual.

These successive additions of sound to the community noise environment varies the community noise level from instant to instant requiring the measurement of noise exposure over a period of time to accurately characterize a community noise environment and evaluate cumulative noise impacts. This time-varying characteristic of environmental noise is described using statistical noise descriptors. The most frequently used noise descriptors are summarized below:

L_{eq}: The equivalent sound level is used to describe noise over a specified period of time, typically 1 hour, in terms of a single numerical value. The L_{eq} is the constant sound level, which would contain the same acoustic energy as the varying sound level, during the same time period (i.e., the average noise exposure level for the given time period).

L_{max}: The instantaneous maximum noise level for a specified period of time.

L_{dn}: The Day/Night Average Sound Level is the 24-hour day and night A-weighed noise exposure level, which accounts for the greater sensitivity of most people to nighttime noise by weighting noise levels at night. Noise between 10:00 p.m. and 7:00 a.m. is weighted (penalized) by adding 10 dBA to take into account the greater annoyance from nighttime noise. (Also referred to as "DNL.")

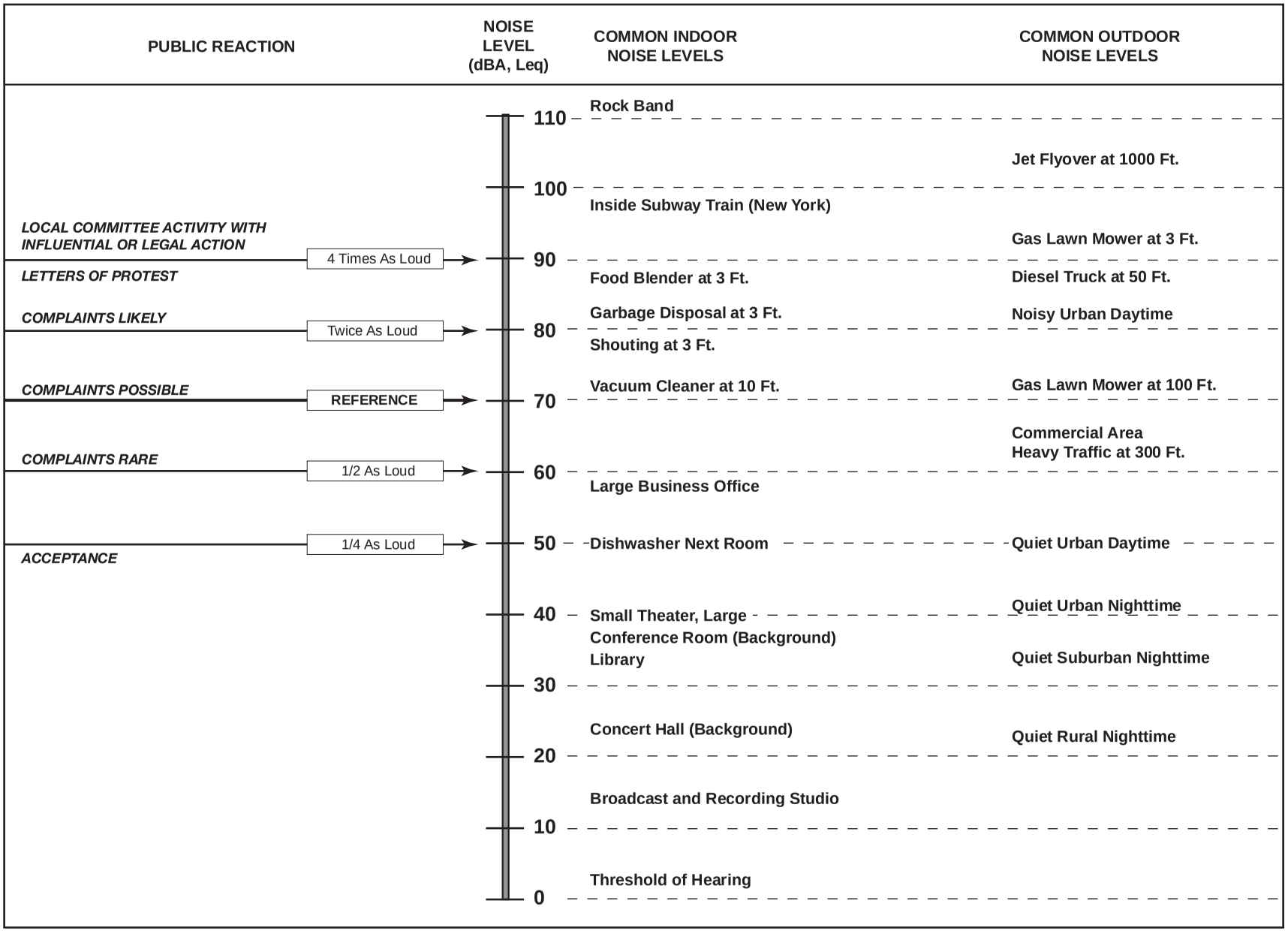
CNEL: Similar to the L_{dn}, the Community Noise Equivalent Level (CNEL) adds a 5-dBA "penalty" for the evening hours between 7:00 p.m. and 10:00 p.m. in addition to a 10-dBA penalty between the hours of 10:00 p.m. and 7:00 a.m.

Effects of Noise on People

The effects of noise on people can be placed into three categories:

1. Subjective effects of annoyance, nuisance, dissatisfaction;
2. Interference with activities such as speech, sleep, learning; and
3. Physiological effects such as hearing loss or sudden startling.

Environmental noise typically produces effects in the first two categories (see **Figure 3.13-1**, *Effects of Noise on People*). Workers in industrial plants generally experience noise in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or the corresponding reactions of annoyance and dissatisfaction. A wide variation exists in the individual



SOURCE: Caltrans Transportation Laboratory Noise Manual, 1982; and modification by ESA

Fountain Wind

Figure 3.13-1
Effects of Noise on People

thresholds of annoyance, and different tolerances to noise tend to develop based on an individual's past experiences with noise.

Thus, an important way of predicting a human reaction to a new noise environment is the way it compares to the existing environment to which one has adapted: the so called "ambient noise" level. In general, the more a new noise exceeds the previously existing ambient noise level, the less acceptable the new noise will be judged by those hearing it. With regard to increases in A-weighted noise level, the following relationships occur (Caltrans, 2013):

- Under controlled conditions in an acoustics laboratory, the trained healthy human ear is able to discern changes in sound levels of 1 dBA.
- Outside these controlled conditions, the trained ear can detect changes of 2 dBA in normal environmental noise.
- It is widely accepted that the average healthy ear, however, can barely perceive changes in the noise level of 3 dBA.
- A change in level of 5 dBA is a readily perceptible increase in noise level.
- A 10 dBA change is recognized as twice as loud as the original source.

These relationships occur in part because of the logarithmic nature of sound and the decibel system. The human ear perceives sound in a non-linear fashion; hence the decibel scale was developed. Because the decibel scale is based on logarithms, two noise sources do not combine in a simple additive fashion, rather they combine logarithmically. For example, if two identical noise sources produce noise levels of 50 dBA, then the combined sound level would be 53 dBA, not 100 dBA.

Noise Attenuation

Stationary point sources of noise, including stationary mobile sources such as idling vehicles, attenuate (lessen) at a rate of 6 to 7.5 dBA per doubling of distance from the source, depending on the topography of the area and environmental conditions (atmospheric conditions and noise barriers, vegetative or manufactured, etc.). Widely distributed noise, such as a large industrial facility spread over many acres or a street with moving vehicles (known as a "line" source), would typically attenuate at a lower rate, approximately 3 to 4.5 dBA each time the distance doubles from the source, which also depends on environmental conditions (Caltrans, 2009). Noise from large construction sites would exhibit characteristics of both "point" and "line" sources, and attenuation therefore generally will range between 4.5 and 7.5 dBA each time the distance doubles.

Health Effects of Noise

The consequences of exposure of people to excessive noise can include annoyance and disturbance of human activities, and, as a result of, frequent, lengthy, and/or high level exposure, effects on human health. The following discussion is provided so that the health implications of noise exposure are fully understood.

Exposure to high levels of noise can cause permanent hearing impairment. The levels at which noise exposure can lead to hearing loss (140 dB) or pain (120 dB) is a common method of measuring health effects or impacts of noise. The federal Occupational Safety and Health Administration (OSHA) has established an occupational noise exposure program which includes hearing conservation standards for long-term noise exposure. Employers are required to measure noise levels; provide free annual hearing exams, hearing protection, and training; and conduct evaluations of the adequacy of the hearing protection in use where noise environments exceed 85 dBA for an 8-hour daily exposure.

Due to the cessation of U.S. Environmental Protection Agency involvement in the development of noise control guidance related to health impacts and, in the absence of any federal or state regulatory guidance on the health effects of noise outside of workplace exposure, this analysis acknowledges the World Health Organization (WHO) as a noted source of current knowledge regarding the health effects of noise impacts because European nations have continued to study noise and its health effects. According to WHO, sleep disturbance can occur when intermittent interior noise levels reach 45 dBA, particularly if background noise is low. WHO also notes that maintaining noise levels within the recommended levels during the first part of the night is believed to be effective for the ability of people to initially fall asleep (WHO, 1999). Excessive noise during sleep periods can result in difficulty falling asleep, awakenings, and alterations in sleep stages and depth (e.g., a reduction in proportion of rapid eye movement [REM] sleep). Exposure to high levels of noise during sleep can also result in increased blood pressure, increased heart rate, increased finger pulse amplitude, vasoconstriction, changes in respiration, cardiac arrhythmia, and an increase in body movements. Secondary physiological effects of exposure to excessive noise during sleep can occur the following day, including reduced perception of quality sleep, increased fatigue, depressed mood or well-being, and decreased performance of cognitive tasks.

Other potential health effects of noise identified by WHO include decreased performance for complex cognitive tasks, such as reading, attention span, problem solving, and memorization; physiological effects such as hypertension and heart disease (after many years of constant exposure, often by workers, to high noise levels); and hearing impairment (again, generally after long-term occupational exposure, although shorter-term exposure to very high noise levels, for example, exposure several times a year to concert noise at 100 dBA, can also damage hearing). Finally, noise can cause annoyance and can trigger emotional reactions like anger, depression, and anxiety. WHO reports that, during daytime hours, few people are seriously annoyed by activities with noise levels at or below 55 dBA.

In 2019, the Health Officer of San Diego County produced a Position Statement regarding the potential health impacts of wind turbines, including potential health impacts from noise (County of San Diego, 2019). The Position Statement acknowledges that noise from wind turbines may cause annoyance and that annoyance is subjectively experienced by a minority of people. Following a comprehensive literature review of studies of the impacts of noise from wind turbines, San Diego County's 2019 Position Statement concludes that "the weight of the evidence suggests that, when sited properly, wind turbines are not related to adverse health effects."

Vehicle traffic and continuous sources of machinery and mechanical noise contribute to ambient noise levels. Short-term noise sources, such as truck backup beepers, the crashing of material being loaded or unloaded, contribute very little to 24-hour noise levels but are capable of causing sleep disturbance and annoyance. The importance of noise to receptors depends on both time and context. For example, long-term high noise levels from large traffic volumes can make conversation at a normal voice level difficult or impossible, while short-term peak noise levels, if they occur at night, can disturb sleep.

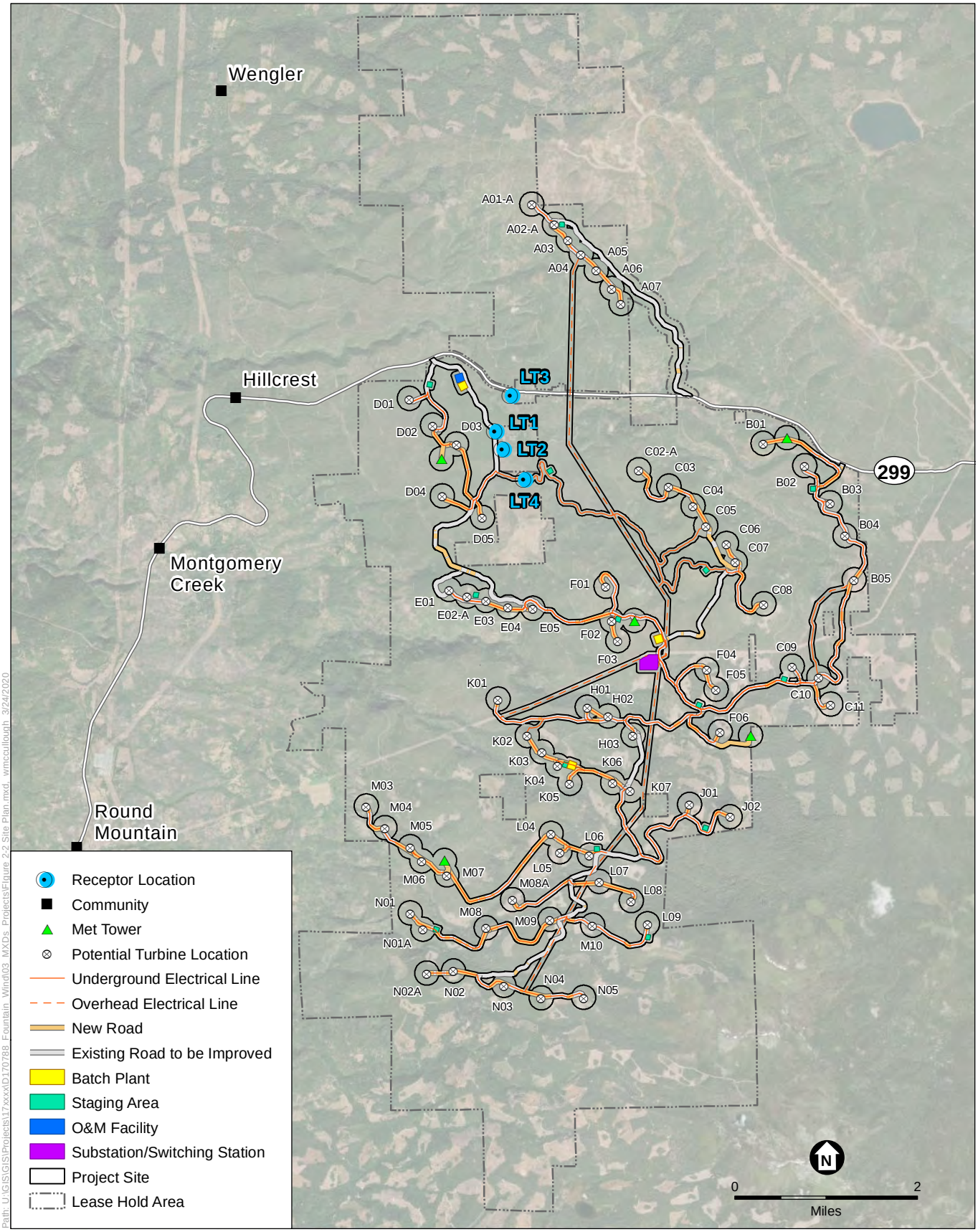
Noise Sources and Levels

The Project Site is located in an unincorporated area of eastern Shasta County, approximately 1 mile west of the existing Hatchet Ridge Wind Project and 6 miles west of Burney. State Route (SR) 299 bisects the Project Site. The private recreational facility and community of Moose Camp is located south of SR 299 and is surrounded by the Project Site. Other surrounding lands are privately owned; many are used for timber harvesting purposes.

Traffic on SR 299 is the primary noise source in the vicinity of the roadway. In areas further from SR 299, the noise environment is primarily comprised of natural sounds, such as wind rustling the leaves of foliage, insects, and birds. The existing noise environment in the area can be characterized by its population density, as population density and ambient noise levels tend to be closely correlated. Areas that are not urbanized are relatively quiet, while areas that are more urbanized are subjected to higher noise levels associated with roadway traffic, industrial activities, and other human activities.

To characterize the noise environment within the Project Site and surrounding area, long-term (24 hours per day over a period of 8 days) noise monitoring was conducted as part of the noise technical report (presented in Appendix G). Long-term noise monitoring was conducted at residential receptor locations nearest to the Project Site in the community of Moose Camp.

Long-term, unattended noise measurements were collected at four locations in the vicinity of the Project Site at locations indicated as LT-1, LT-2, LT- 3, and LT-4 in **Figure 3.13-2**, *Noise Measurement Locations*. Measurements were conducted over an 8-day period from Sunday, August 19, 2018, to Monday, August 27, 2018. The monitoring locations were selected to represent the closest residences to construction/decommissioning and operational elements of the Project. Sites LT-1, LT-2, and LT-3 were selected at distances of about 100 feet from the closest residences, in the worst-case location relative to the proposed turbines. Due to the inaccessibility of the residence to the south (represented by LT-4), measurements were not attempted on this property, but rather were taken adjacently, to be representative of the residence. The long-term noise levels were measured with Larson-Davis 820 Type 1 sound level meters calibrated before and after the surveys. **Table 3.13-2** presents a summary of the noise data collected during the noise monitoring effort.



SOURCE: Stantec

Fountain Wind Project

Figure 3.13-2
Noise Measurement Locations

TABLE 3.13-2
MONITORED NOISE ENVIRONMENTS WITHIN THE PROJECT AREA

Location	Time Period	Hourly L_{eq}		L_{dn}, dBA
		Average, dBA	Range, dBA	
LT-1	Daytime	40	28-49	43-45
	Nighttime	36	32-45	
LT-2	Daytime	38	28-50	42-44
	Nighttime	34	28-42	
LT-3	Daytime	47	39-53	53-54
	Nighttime	46	40-53	
LT-4	Daytime	42	38-49	47-50
	Nighttime	42	38-48	

Ambient noise levels in Table 3.13-2 are presented in the hourly L_{eq} as this is the primary metric utilized in Shasta County noise regulations. As indicated in the data, there is considerable variation in noise levels between test days and times of day at each site. The average hourly L_{eq} values for the daytime hours (7:00 a.m. to 10:00 p.m.) and the nighttime hours (10:00 p.m. to 7:00 a.m.) are shown in Table 3.13-2 along with the average L_{dn} levels for each long-term measurement. At all sites and on all measurement days, noise levels increased substantially (15 to 20 dB) around 8:00 p.m. and then dropped off slowly between 8:00 p.m. and 11:00 p.m. These elevated noise levels occurring between approximately 7:00 p.m. and 11:00 p.m. are thought to be attributable to insects and other natural sounds.

Monitored daytime noise levels were about 4 dBA greater than nighttime noise levels at locations LT-1 and LT-2, but were similar between daytime and nighttime periods at LT-3 and LT-4. The noise environment at LT-1, LT-2, and LT-4 is primarily comprised of natural sounds, such as wind rustling the leaves of foliage, insects, and birds, and vehicular traffic on local logging roads. Noise from occasional traffic on SR 299 is the primary noise source at LT-3, along with evening insect noise.

Infrasound

Scoping comments enquired about and suggested potential impacts of infrasound (i.e., sound waves with frequencies below the lower limit of 20 Hz) and the potential it may have to cause neurological and physiological disorders resulting in feelings of sea sickness, annoyance, fatigue, pressure or tinnitus (ear ringing), sleep disturbance or sleeplessness, headaches, or vibroacoustic disease (Appendix J).

The two aspects of sound that allow for its recognition and perception are frequency or pitch (measured in Hz), and pressure or loudness (measured in dB). Wind turbines make mechanical sounds from their component parts (e.g., the gearbox) and aerodynamic sound (e.g., from air flow around the blades and turbine tower), which is variable and depends on atmospheric and other conditions (Roberts and Roberts, 2013). “Infrasound” is generally inaudible sound with a frequency of less than 20 Hz, which is the “normal” limit of human hearing. Because hearing

becomes gradually less sensitive as frequency decreases, the sound pressure must be sufficiently high for humans to perceive infrasound.

Vibration Background

Vibration is an oscillatory motion through a solid medium in which the motion's amplitude can be described in terms of displacement, velocity, or acceleration. Several different methods are used to quantify vibration. The peak particle velocity (PPV) is defined as the maximum instantaneous peak of the vibration signal. The PPV is most frequently used to describe physical vibration impacts on buildings. Typically, groundborne vibration generated by human activities attenuates rapidly with distance from the source of the vibration. Sensitive receptors to vibration include people (especially residents, the elderly, and sick people), structures (especially older masonry structures), and vibration-sensitive equipment.

Another useful vibration descriptor is known as vibration decibels or VdB. VdB generally are used when evaluating human response to vibration, as opposed to structural damage (for which PPV is the more commonly used descriptor). Vibration decibels are established relative to a reference quantity, typically 1 x 10^{-6} inches per second (FTA, 2018). There are no substantial existing sources of vibration in the study area.

Human Annoyance from Vibration

Caltrans has published and developed a summary of criteria relating to human perception that correlates the potential for perception and annoyance from groundborne vibration. Such human responses are dependent on whether a vibration source is continuous or transient. Transient sources create a single isolated vibration event, such as blasting. Continuous/frequent intermittent sources include impact pile drivers, pogo-stick compactors, vibratory pile drivers, and vibratory compaction equipment. **Table 3.13-3** presents a summary of human response to vibration for both continuous and transient sources.

TABLE 3.13-3
HUMAN ANNOYANCE AND BUILDING DAMAGE POTENTIAL FROM VIBRATION

Velocity Level, PPV (in/sec)	Human Reaction	Effect on Buildings
0.01	Barely perceptible	No effect
0.04	Distinctly perceptible	Vibration unlikely to cause damage of any type to any structure.
0.08	Distinctly perceptible to strongly perceptible	Recommended upper level of the vibration to which ruins and ancient monuments should be subjected.
0.1	Strongly perceptible	Threshold at which there is a risk of damage to fragile buildings with no risk of damage to most buildings.
0.25	Strongly perceptible to severe	Threshold at which there is a risk of damage to historic and some old buildings.
0.3	Strongly perceptible to severe	Threshold at which there is a risk of damage to older residential structures.
0.5	Severe - Vibrations considered unpleasant	Threshold at which there is a risk of damage to new residential and modern commercial/industrial structures.

SOURCE: Caltrans, 2013b

Blasting-Induced Vibration

When explosive charges are detonated in rock, the blast has been designed so that most of the energy is used in breaking and displacing the rock mass. However, some of the energy also can be released in the form of transient stress waves, which in turn cause temporary ground vibration. Detonating charges also create rock movement and the release of high-pressure gas, which in turn, induces air-overpressure (blast noise).

The average person is quite sensitive to ground motion, and vibration levels as low as 0.01 inches/second (in/sec) can be detected by the human body. Frequency of motion or cycles per second is a measure of how many times a particle of ground moves back and forth (or up and down) in 1 second. Frequency is expressed in units of Hz.

Noise from blasting or "blast noise" is composed primarily of sound pressures at frequencies below the threshold-of-hearing for humans (16 to 20 Hz). Hence, the common industry term for blast-induced noise is "air-overpressure." As its name implies, air-overpressure is a measure of the transient pressure changes above and below ambient atmospheric pressure.

Air-overpressure measurements are typically expressed in dB units, and when the scale is linear, the unit designation is "dB(L)." Regular acoustical noise measurements taken for the purpose of monitoring compliance with local noise ordinances almost always use weighted scales that discriminate against low frequency noise. Thus, for a similar noise source, A-weighted and C-weighted scales will usually record significantly lower levels of noise.

The regulatory limit defined by the former U.S. Department of the Interior, Bureau of Mines (U.S. Bureau of Mines) for air-overpressure measured with 2-Hz response seismographs is 133 dB(L) (USDI, 2000). Damage to old or poorly glazed windows does not occur until air-overpressure reaches approximately 150 dB(L). Because the decibel scale is a logarithmic ratio, the actual overpressure at the 133 dB(L) limit, is over seven times lower than the threshold damage level at 150 dB(L).

When blasting occurs at large distances from sensitive structures, the primary concern is damage to structures. Structural damage can be classified as cosmetic, such as paint flaking or minimal extension of cracks in building surfaces; minor, including limited surface cracking; or major, that may threaten the structural integrity of the building. Safe vibration limits that can be applied to assess the potential for damaging a structure vary by researcher. The damage criteria presented in Table 3.13-3 include several categories for ancient, fragile, and historic structures, the types of structures most at risk to damage. Most buildings are included within the categories ranging from "Historic and some old buildings" to "Modern industrial/commercial buildings." Construction-induced vibration that can be detrimental to the building is very rare and has only been observed in instances where the structure is at a high state of disrepair and the construction activity occurs immediately adjacent to the structure.

The annoyance levels shown in Table 3.13-3 should be interpreted with care since vibration may be found to be annoying at lower levels than those shown, depending on the level of activity or the sensitivity of the individual. To sensitive individuals, vibrations approaching the threshold of

perception can be annoying. Low-level vibrations frequently cause irritating secondary vibration, such as a slight rattling of windows, doors, or stacked dishes. The rattling sound can give rise to an elevated human reaction, even though there is very little risk of actual structural damage.

Sensitive Receptors

Human response to noise varies considerably from one individual to another. Effects of noise at various levels can include interference with sleep, concentration, and communication; physiological and psychological stress; and hearing loss. Given these effects, some land uses are considered more sensitive to ambient noise levels than others. In general, residences, schools, hotels, hospitals, and nursing homes are considered to be the most sensitive to noise. Commercial and industrial uses are considered the least noise-sensitive. The primary sensitive receptors near the Project Site are residential dwellings in the private Moose Camp recreational area (Figure 3.13-2). The closest residences are located about 2,200 feet from the nearest proposed turbines and more than 2,000 feet from the proposed transmission lines, Roadway construction activities could occur as close as 580 feet from receptor LT-2, the nearest residence. The closest residence to the west access road (represented by LT-1) is located about 300 feet from the center of the road. The closest existing residential areas to the proposed substation location are 1.5 miles to the northwest and southwest.

3.13.1.3 Regulatory Setting

Federal

There are no federal plans, policies, regulations, or laws related to noise that are directly applicable to the Project. However, guidelines have been established to address the potential for groundborne vibration to cause structural damage to buildings. For fragile structures, a maximum limit of 0.25 in/sec PPV is recommended (FTA, 2018).

State

The State of California General Plan Guidelines, published by the Governor's Office of Planning and Research, provide guidance for evaluating the compatibility of a given noise environment for proposed land uses. These land use compatibility standards are developed in terms of the CNEL/L_{dn} metric. Generally, residential uses are considered acceptable in areas where exterior noise levels do not exceed 60 dBA CNEL/L_{dn}. Hospitals are normally acceptable in areas up to 70 dBA CNEL/L_{dn} and normally unacceptable in areas exceeding 70 dBA CNEL/L_{dn}. The guidelines also present adjustment factors that may be used to arrive at noise-acceptability standards reflecting the particular community's noise-control goals, noise sensitivity, and assessment of the relative importance of noise issues.

With respect to vibration, Caltrans recommends use of thresholds that consider the human response to vibration for both continuous and transient sources shown above in Table 3.13-3.

Local

Shasta County General Plan

The Noise Element of the Shasta County General Plan establishes Objective N-1 to protect County residents from the harmful and annoying effects of exposure to excessive noise. The General Plan considers siting of new residential land uses to be "generally acceptable" in noise environments of 60 dBA L_{dn} or less and "conditionally acceptable" in noise environments between 60 to 70 dBA L_{dn}.

Specific policies of the Noise Element that apply to the Project are summarized below:

Policy N-b: Noise likely to be created by a proposed non-transportation land use shall be mitigated so as not to exceed the noise level standards of an hourly L_{eq} of 55 dBA during daytime hours (7 a.m. to 10 p.m.) and 50 dBA during nighttime hours (10 p.m. to 7 a.m.) as measured immediately within the property line of adjacent lands designated as noise-sensitive.

The noise levels specified above shall be lowered by 5 dB for simple tone noises[2], noises consisting primarily of speech or music, or for recurring impulsive noises. These noise level standards do not apply to residential units established in conjunction with industrial or commercial uses (e.g., caretaker dwellings). The County can impose noise level standards, which are more restrictive than those specified above based upon determination of existing low ambient noise levels.

In rural areas where large lots exist, the exterior noise level standard shall be applied at a point 100 feet away from the residence. Industrial, light industrial, commercial, and public service facilities which have the potential for producing objectionable noise levels at nearby noise-sensitive uses are dispersed throughout the County. Fixed-noise sources which are typically of concern include, but are not limited to, the following: HVAC Systems; Pump stations, emergency generators, steam valves, generators, air compressors, conveyor systems, pile drivers, drill rigs, welders, outdoor speakers, cooling towers/evaporative condensers, lift stations, boilers, steam turbines, fans, heavy equipment, transformers, grinders, gas or diesel motors, cutting equipment and blowers. The types of uses which may typically produce the noise sources described above include, but are not limited to: industrial facilities including lumber mills, trucking operations, tire shops, auto maintenance shops, metal fabricating shops, shopping centers, drive-up windows, car washes, loading docks, public works projects, batch plants, bottling and canning plants, recycling centers, electric generating stations, race tracks, landfills, sand and gravel operations, and athletic fields. For the purposes of the Noise Element, transportation noise sources are defined as traffic on public roadways, railroad line operations, and aircraft in flight. Control of noise from these sources is preempted by Federal and State regulations. Other noise sources are presumed to be subject to local regulations, such as a noise control ordinance. Non-transportation noise sources may include industrial operations, outdoor recreation facilities, HVAC units, loading docks, etc.

Policy N-c: Where proposed non-residential land uses are likely to produce noise levels exceeding the performance standards of Policy N-b upon existing or planned noise-sensitive uses, an acoustical analysis shall be required as part of the environmental review process so that appropriate noise mitigation may be included in the project design. The requirements for the content of an acoustical analysis are:

[2] Tone, in acoustics, is sound that can be recognized by its regularity of vibration. A simple tone has only one frequency, although its intensity may vary. Because wind turbines generate sound across a spectrum of frequencies, they would not be considered to generate simple tone noise.

A. Be the financial responsibility of the applicant.

B. Be prepared by a qualified person experienced in the fields of environmental noise assessment and architectural acoustics.

C. Include representative noise level measurements with sufficient sampling periods and locations to adequately describe local conditions and the predominant noise sources.

D. Estimate existing and projected cumulative (20 years) noise levels in terms of L_{dn} or CNEL and/or the standards of [General Plan] Table I, and compare those levels to the adopted policies of the Noise Element.

E. Recommend appropriate mitigation to achieve compliance with the adopted policies and standards of the Noise Element, giving preference to proper site planning and design over mitigation measures which require the construction of noise barriers or structural modifications to buildings which contain noise-sensitive land uses.

F. Estimate the noise exposure after the prescribed mitigation measures have been implemented.

G. Describe a post-project assessment program which could be used to evaluate the effectiveness of the proposed mitigation measures.

Policy N-g: Existing noise-sensitive uses may be exposed to increased noise levels due to future roadway improvement projects as a result of increased traffic capacity and volumes and increases in travel speeds. In these instances, it may not be practical to reduce increased traffic noise levels consistent with those applicable to residential land uses which are specified to be 60 dBA, L_{dn} for outdoor activity areas and 45 dBA, L_{dn} for interior spaces. Therefore, as an alternative, the following criteria may be used as a test of significance for increases in the ambient outdoor activity areas of the noise level of noise-sensitive uses created as a result of a new roadway improvement project:

- Where existing traffic noise levels are less than 60 dB L_{dn}, a +5 dB L_{dn} increase will be considered significant.
- Where existing traffic noise levels range between 60 and 65 dB L_{dn}, a +3 dB L_{dn} increase will be considered significant.
- Where existing traffic noise levels are greater than 65 dB L_{dn}, a + 1.5 dB L_{dn} increase will be considered significant.

Policy N-i: Where noise mitigation measures are required to achieve the standards of Policies N-b and N-g, the emphasis of such measures shall be placed upon site planning and project design. The use of noise barriers shall be considered a means of achieving compliance with the noise standards only after all other practical design-related noise mitigation measures have been integrated into the project.

Shasta County Code

Section 17.88.035 of the Shasta County Code addresses small wind energy systems and allows for them to be permitted with an approved administrative permit, subject to specific requirements, including the noise restrictions of the General Plan Noise Element. Because the Project would not meet the specified requirements defining a “small” wind energy system, this section of the code is not applicable to the Project. The Shasta County Code does not establish quantitative noise

standards and defers to the standards contained within the Shasta County General Plan Noise Element.

3.13.2 Significance Criteria

CEQA Guidelines Appendix G Section XIII identifies considerations relating to noise. See Section 3.1.4, *Environmental Considerations Unaffected by the Project or Not Present in the Project Area*, as it relates to the County's analysis of the potential noise impacts of this Project. Otherwise, for purposes of this analysis, a project would result in a significant impact to noise or vibration if it would result in:

a) Generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies; or

b) Generation of excessive groundborne vibration or groundborne noise levels.

Criterion a) examines whether project construction and/or operations would generate noise in excess of established noise standards, which are assessed for stationary, mobile, and construction noise sources. The evaluation of the Project relative to this criterion focuses first on contributions in ambient noise levels from stationary sources during Project operation and their relationship to the standards of General Plan Policy N-b. A significant noise impact would be identified if Project stationary sources would result in a noise level that would exceed 55 dBA during daytime hours (7:00 a.m. to 10:00 p.m.) and 50 dBA during nighttime hours (10:00 p.m. to 7:00 a.m.)

Additionally, a noise impact would be identified if operational traffic noise generated specifically by roadway improvements of the Project[3] would substantially increase noise levels at sensitive receivers in the vicinity. Shasta County General Plan Policy N-g defines noise level increases of 5 dB L_{dn} where existing traffic noise levels are less than 60 dB L_{dn}, where existing traffic noise levels range between 60 and 65 dB L_{dn}, a 3 dB L_{dn} increase would be significant and where existing traffic noise levels are greater than 65 dB L_{dn}, a 1.5 dB L_{dn} increase would be significant.

Assessment of operational low frequency noise impacts from turbines applies a threshold for concern for low frequency noise. A significant impact would occur if the C-weighted level exceeds the A-weighted level by 20 dB or more (as applied in the Project-specific traffic study included in **Appendix**) or if the 1/3rd octave band thresholds discussed in Section 3.13.3.1, *Methodology*, are exceeded (Kern County, 2006).

The contribution of the Project to localized increases in traffic-generated noise along roadways improved as part of the Project or roadways used to access the Project Site is considered relative to published measures of substantial increase in transportation noise, as defined General Plan Policy N-g.

[3] No offsite roadway improvements are proposed as part of the Project. Therefore, this analysis pertains only to operational traffic on roads proposed for improvement within the Project Site.

Neither Shasta County nor the State of California specifies a quantitative threshold of significance for the impact of temporary increases in noise due to construction. In lieu of any regulatory guidance, this evaluation uses speech interference as an indicator that construction noise could cause a substantial adverse impact on daytime and evening activities, and sleep interference as an indicator that construction noise could cause a substantial adverse impact on nighttime activities. The speech and sleep interference criteria are based on objective research of speech and sleep interference (as opposed to subjective surveys of annoyance) and can be used to evaluate a project's noise impacts. The speech and sleep interference criteria used in this EIR are defined below:

- **Speech Interference.** A speech interference threshold, in the context of impact duration and time of day, is used to identify substantial increases in noise from temporary construction activities. This analysis assumes noise peaks generated by construction equipment could result in speech interference in adjacent buildings if the noise level in the interior of the buildings exceeds 45 dBA. A typical building can reduce noise levels by approximately 25 dBA with the windows closed[4] (USEPA, 1974). This noise reduction could be maintained only on a temporary basis in some cases, since it assumes windows must remain closed at all times. Assuming a 25 dBA reduction with the windows closed, an exterior noise level of 70 dBA L_{eq} would maintain an acceptable interior noise environment of 45 dBA during the day and evening hours. Noise levels would vary depending on the phase of construction and the types of construction equipment being used.

  In addition to the decibel level of noise, the duration of exposure at any given noise-sensitive receptor is an important factor in determining an impact's significance. Generally, temporary construction noise that occurs during the day for a relatively short period of time would not be significant because most people of average sensitivity who live in suburban or rural agricultural environments are accustomed to a certain amount of construction activity or heavy equipment noise from time to time. The loudest construction-related noise levels would be sporadic rather than continuous because different types of construction equipment would be used throughout the construction process. Therefore, an exterior noise level that exceeds 70 dBA L_{eq} during the daytime is used as the threshold for substantial construction noise where the duration of construction noise exceeds two weeks.

- **Sleep Interference.** Based on available sleep data, an interior nighttime level of 35 dBA is considered acceptable for sleeping (USEPA, 1974). Assuming a 25 dBA reduction with the windows closed, an exterior noise level of 60 dBA would maintain an acceptable interior noise environment of 35 dBA at night. Therefore, a significant impact would occur if the proposed project were to generate exterior noise levels above the 60 dBA L_{eq} sleep interference threshold for one or more nights.

Construction-related vibration from potential blasting activities are assessed based on available reference monitoring data from blasting activities and the California Department of Transportation's recommended vibration limits to avoid structural damage of nearby structures.

[4] Because these estimates were developed in 1974, it is reasonably assumed that older single-paned windows were considered in these attenuation estimates and that greater reductions could be realized with more modern double-paned windows.

3.13.3 Direct and Indirect Effects

3.13.3.1 Methodology

The information and analysis presented in this section are (as noted above) based in part on data provided in Appendix G. The study area for evaluation of noise and vibration impacts from construction consists of a distance of 5,000 feet (approximately 1 mile) without mitigation for the reasons explained in Section 3.13.1.1, *Study Area*.

Stationary Source Operational Noise Impacts

Noise Assessment for Wind Turbines

Shasta County regulations do not specifically address the operational characteristics of large-scale wind turbines. Wind turbines only operate when the wind exceeds a "cut-in" speed, which is typically about 4 meters/second (8.9 miles/hour [mph]). As a result, they do not produce noise continuously. For Shasta County, the noise limits established in Policy N-b of the Noise Element are interpreted to be not-to-exceed levels, or essentially steady-state levels. Because wind turbines may operate day or night, the nighttime limit (50 dBA as measured immediately within the property line of adjacent lands designated as noise-sensitive) is considered as the appropriate level with which to compare the estimated noise levels produced by the Project. As explained in Section 3.13.1.3, the proposed turbines would operate at multiple frequencies and would not generate simple tone noises,[5] nor would their noise consist of speech or music, or recurring impulsive noises. Therefore, no additional adjustments to these standards are required. As shown in Table 3.13-2, hourly average noise levels can reach 50 dBA at the nearest receptors and imposition of noise level standards more restrictive than those specified above would not be warranted.

The closest residences are located approximately 2,200 feet from the nearest turbine sites. Given the long propagation distances and mountainous terrain between the turbines and the closest receptors, turbine sound would be subject to additional attenuation by shielding from intervening terrain, atmospheric absorption, and ground absorption. Three-dimensional modeling (using SoundPLAN Version 8.1) was conducted to account for topography, atmospheric and ground absorption, and the spectral characteristics of the noise sources. Neutral environmental conditions are assessed for CEQA purposes (i.e., no wind or temperature gradients). Turbines would be unlikely to operate during temperature gradients, such as an inversion, which occur during periods of atmospheric stability.[6] The model was run assuming a worst-case condition with simultaneous operation of all wind turbines.

5 Tone, in acoustics, is sound that can be recognized by its regularity of vibration. A simple tone has only one frequency, although its intensity may vary. Because wind turbine generate sound across a spectrum of frequencies, they would not be considered to generate simple tone noise.

6 An air temperature inversion is a reversal of the typical daytime air temperature in the layer of atmosphere closest to the ground. Usually, the temperature of the air during the day decreases as altitude increases. However, with the presence of an atmospheric inversion, there is an increase of air temperature with the increase in altitude, meaning there is warmer, lighter air aloft with a cooler, heavier layer of air next to the ground. When there is little to no wind present, these two air masses will not mix, resulting in a distinct temperature inversion.

Infrasonic Turbine Noise

Neither the State of California nor Shasta County specifically address low frequency noise and infrasonic noise from wind energy or other projects. However, low frequency noise and infrasonic noise from wind energy projects should be explored as part of a complete noise assessment (Waye, 2009). Other criteria can be considered to determine if the Project would exhibit high infrasonic noise generation potential. In general, low frequency noise has been associated with older generation, downwind turbines. For these older turbines, the wake of the tower interacts with the passing blades to generate pulses at the rate the blades pass the tower. Low frequency noise typically is minimized with upwind turbines. Objective sound pressure level guidelines have been inferred from several different sources as described below.

One source of low frequency criteria is the Alameda County Standard Conditions of Permit Approval for Windfarms (Alameda County, 1998). This document uses 70 dBC L_{dn} as the threshold for considering "reasonable complaints." Another source of low frequency criteria within the state is the Kern County Code (Kern County, 2006). Under these criteria, the low frequency noise levels at 50 feet from a residence are given below for 1/3 octave bands centered at 2 to 125 Hz as shown in **Table 3.13-4**. In the infrasonic range (below 20 Hz), the Table 3.13-4 criteria are actually lower than the established threshold of hearing at each frequency by 18 to 37 dB (USEPA, 1973). As a result, achieving the values shown for the Kern County criteria would assure that any infrasonic noise generated by the Project would be sufficiently low in level to avoid any noise impact.

TABLE 3.13-4
KERN COUNTY LOW FREQUENCY NOISE CRITERIA

1/3 Octave Band Center Frequency, Hz	Noise Level Limit, dB
2 to 16	70
20	68
25	67
31.5	65
40	62
50	60
63	57
80	55
100	52
125	50

SOURCE: Kern County, 2006

Onsite Collector Substation and Switching Station Noise

An onsite collector substation and switching station (substation) would increase the voltage of the electricity from the collection system to match the voltage of the existing PG&E line that would transmit the electricity from the Project Site. The basic elements of the substation facilities include a control house, a bank of one or two main transformers, outdoor breakers, capacitor banks, relaying equipment, high-voltage bus work, steel support structures, an underground grounding grid, and overhead lightning-suppression conductors. The primary operational noise sources proposed at the substation are anticipated to be transformers.

Noise impacts from the substation were estimated using reference noise levels for transformers, the number of transformers proposed, and equations predicting unobstructed noise attenuation with distance. Predicted noise levels are then compared to the noise limits established in Policy N-b of the County's General Plan Noise Element.

Corona Noise

The Project would include overhead collector lines at 34.5 kV and a transmission line at 230 kV to match the voltage of the existing PG&E 230 kV line. The short 230 kV line interconnection to the existing PG&E electricity grid system would be installed from the substation. The 34.5 kV collector line would run north to south within the Project Site. The localized electric field near an energized conductor can be sufficiently concentrated to produce a small electric discharge, which can ionize air close to the conductors. This effect is called "corona," and it is associated with all energized electric power lines. Corona can result in the production of small amounts of sound. Corona noise typically is characterized as a hissing or crackling sound, which may be accompanied by a 120-hertz hum. Slight irregularities or water droplets on the conductor and/or insulator surface accentuate the electric field strength near the conductor surface, making corona discharge and the associated audible noise more likely. Therefore, audible noise levels from transmission and collector lines would generally be higher during wet weather conditions.

Noise levels from corona effects were estimated using computer modeling software developed by the Bonneville Power Administration. Resulting corona noise estimates are then compared to the noise limits established in Policy N-b of the Noise Element.

Noise from Operation and Maintenance Activities

Operation and maintenance activities generally would occur during normal workday hours from Monday to Saturday. While turbines would be monitored and controlled using a remote off-site monitoring system, routine on-site maintenance activities would be required and are expected to include verification of torque on tower bolts and anchors and checks for cracks and other signs of stress on the turbine tower and components; and inspection for leakage of lubricants and hydraulic fluids and repainting. Each turbine also would be serviced twice a year, or as needed. Turbine servicing would require maintenance staff to climb towers and service turbine parts by performing activities such as removing the turbine rotor and replacing generators and bearings. Scheduled maintenance may require the use of a crane within the 65- to 95-foot diameter areas around the turbines.

The post-construction scenario would be equivalent to existing conditions, as it includes only a minimal number of 12 employees accessing the Project Site for maintenance and operations.

Maintenance noise levels were calculated using the Federal Highway Administration (FHWA) software (the Roadway Construction Noise Model [RCNM]), assuming operation of a crane and the distance to the nearest sensitive receptors, and not taking into account any noise reduction from intervening shielding by structures or terrain. Resulting noise estimates then were compared to speech interference thresholds cited above for construction noise impacts.

Construction, Decommissioning, and Site Reclamation Noise and Vibration Impacts

During each stage of construction, there would be a different mix of equipment operating, and noise levels would vary by stage and vary within stages, based on the amount of equipment in operation and the location at which the equipment is operating. Typical construction noise levels at 50 feet for equipment likely to be used in the construction of the Project are shown in **Table 3.13-5**, *Typical Noise Levels from Construction Equipment*. Most construction activities at a wind turbine facility generate noise levels in the range of 80 to 85 dBA L_{max} at 50 feet from the source (Appendix G). Hourly average noise levels would also be in the range of 80 to 85 dBA L_{eq} during periods of heavy construction. The types of noise sources that would be associated with construction of the Project are described below. For the purposes of this analysis, it is assumed that Project decommissioning and site reclamation activities would result in similar noise levels as would occur during construction.

TABLE 3.13-5
TYPICAL NOISE LEVELS FROM CONSTRUCTION EQUIPMENT

Construction Equipment	Noise Level (dBA, L_{max} at 50 feet)
Backhoe	80
Concrete mixer	85
Concrete Pump	82
Concrete batch plant	83
Crane	85
Dozer	85
Excavator	85
Air Compressor	78
Front End Loader	80
Grader	85
Paver	85
Rock Drill	85
Scraper	85
Slurry Trenching Machine	82
Soil Mixing Drill Rig	80
Truck (Dump, Delivery)	84
Vibratory Compactor	80
Al other equipment with engines larger than 5 horsepower	85

SOURCE: National Cooperative Highway Research Program, 1999.

Noise from Construction Equipment

Noise levels from construction are estimated based on the reference noise levels presented in Table 3.13-5 and attenuation accounted for using sound level propagation equations. The resultant noise levels were compared to standards identified in the Shasta County General Plan Policy N-b.

Predicted noise levels from helicopter operations also are compared to speech interference thresholds published by the USEPA. Noise generated by construction equipment could result in speech interference in adjacent nearby buildings if the noise level in the interior of the buildings exceeds 45 dBA. Assuming a 25 dBA reduction with the windows closed, an exterior noise level of 70 dBA L_{eq} would maintain an acceptable interior noise environment of 45 dBA during the day and evening hours.

Noise from Construction Trucks

Construction and post-construction traffic volume estimates are provided in the Project's traffic study (**Appendix H**, *Transportation*). Over the up to 24-month construction period, the total number of all trips, including worker commute truck trips and heavy haul truck trips, is estimated to be approximately 93,088 trips (see Section 3.14, *Transportation*). The increase in traffic noise is calculated for both SR 299 as well as for the west, north, and east access roads. Predicted truck traffic noise then is compared to the County's 3 dBA L_{dn} increase or 5 dBA L_{dn} increase thresholds depending on the existing noise levels.

Blasting Noise

Assessment of the noise impact from Project blasting activities uses empirical measurements conducted by Illingworth & Rodkin, Inc. (Appendix G), at a reference distance to estimate the resulting noise levels that would occur at Project-specific distances to residential receptors, and then the estimated noise levels at the residential receptors are compared to the regulatory limit defined by the former U.S. Bureau of Mines for air-overpressure of 133 dB(L).

Helicopter Noise

Noise levels from helicopters that may be used to string the overhead collector lines and the transmission line connection are estimated based on the reference noise level of 100 dBA at a distance of 100 feet (FICON, 1992) and equations to predict unobstructed noise attenuation at the nearest residences for comparison with noise levels documented to result in speech interference outdoors and sleep disturbance indoors, assuming a 15 dBA exterior-to-interior noise reduction with windows partially open.

Blasting Vibration

When blasting occurs at large distances from sensitive structures, the primary concern is cosmetic damage to the structures. Cosmetic damage (e.g., minor cracking in plastered walls) can occur as a result of ground-borne vibration or acoustic overpressures. Vibration from blasting events on the Project Site were calculated using methods established by the former U.S. Bureau of Mines. The U.S. Bureau of Mines studies indicate no observations of "threshold damage" (referred to as cosmetic damage elsewhere in this report), "minor damage" or "major damage" at vibration levels of 0.4 in/sec PPV or less (Siskind et al., 1980). Caltrans recommends a vibration limit of 0.5 in/sec PPV for structurally sound buildings designed to modern engineering standards, and 0.3 in/sec PPV for buildings that are found to be structurally sound but where structural damage is a major concern. The more conservative limit (0.3 in/sec PPV) is used in this analysis.

3.13.3.2 Direct and Indirect Effects of the Project

a) Whether the Project would result in the generation of a substantial temporary or permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Impact 3.13-1: Operation of the Project could result in the generation of a substantial permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the Shasta County General Plan or the applicable standards of other agencies. (*Less-than-Significant Impact*)

Summary of Operational Noise Impacts from All Sources

Operational noise from Project operations would be generated by a number of different sources, some of which would be predominant while others would be intermittent. The predominant noise would be generated by the operation of turbines, which are analyzed below assuming 24-hour per day operation of all turbines simultaneously. Additionally, there would be intermittent noise from operations of the substation, the potential for corona noise from overhead connector and transmission lines during wet weather conditions, and intermittent noise from operations and maintenance activities of up to 12 employees during daytime hours. Noise from each of these sources is analyzed individually below.

Table 3.13-6, *Predicted Contributions of Operational Noise Sources,* tabulates the contribution of each of these sources at the nearest noise sensitive receptors where long-term noise measurements were collected, as analyzed below; totals their contributions into an overall operational contribution; and compares the logarithmically summed total to the noise standards established by General Plan Policy N-b. Note that maintenance activities would only occur during daytime hours and, hence, there are separate totals for daytime noise levels and nighttime noise levels as there are also separate standards for daytime and nighttime noise established by Policy N-b.

While operational noise may, at times, be perceptible to the nearest receptor during the quietest nighttime hours, worst-case operational noise levels would be less than County General Plan standards and the Project would have a less-than-significant impact with respect to generation of a permanent increase in ambient noise levels in the vicinity of the Project in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.

Wind Turbines

The proposed 72-turbine layout is shown in Figure 2-2, *Site Plan*. Based on preliminary design, the Nordex N163/5.X turbine was selected as the worst-case, loudest turbine that could be used at the Project Site. This turbine has a maximum sound power level[7] of 109.2 dBA and a hub height of 118 meters (387 feet).

[7] Sound power level is an engineering specification and is a separate metric from sound pressure level use elsewhere in this analysis. Sound power level is independent of the distance a receiver is from the source and is a property of the source alone. Knowing the sound power level of an idealized source and its distance from a receiver, the sound pressure level at the receiver point can be calculated based on geometrical spreading of sound from the source.

TABLE 3.13-6
PREDICTED CONTRIBUTIONS OF OPERATIONAL NOISE SOURCES

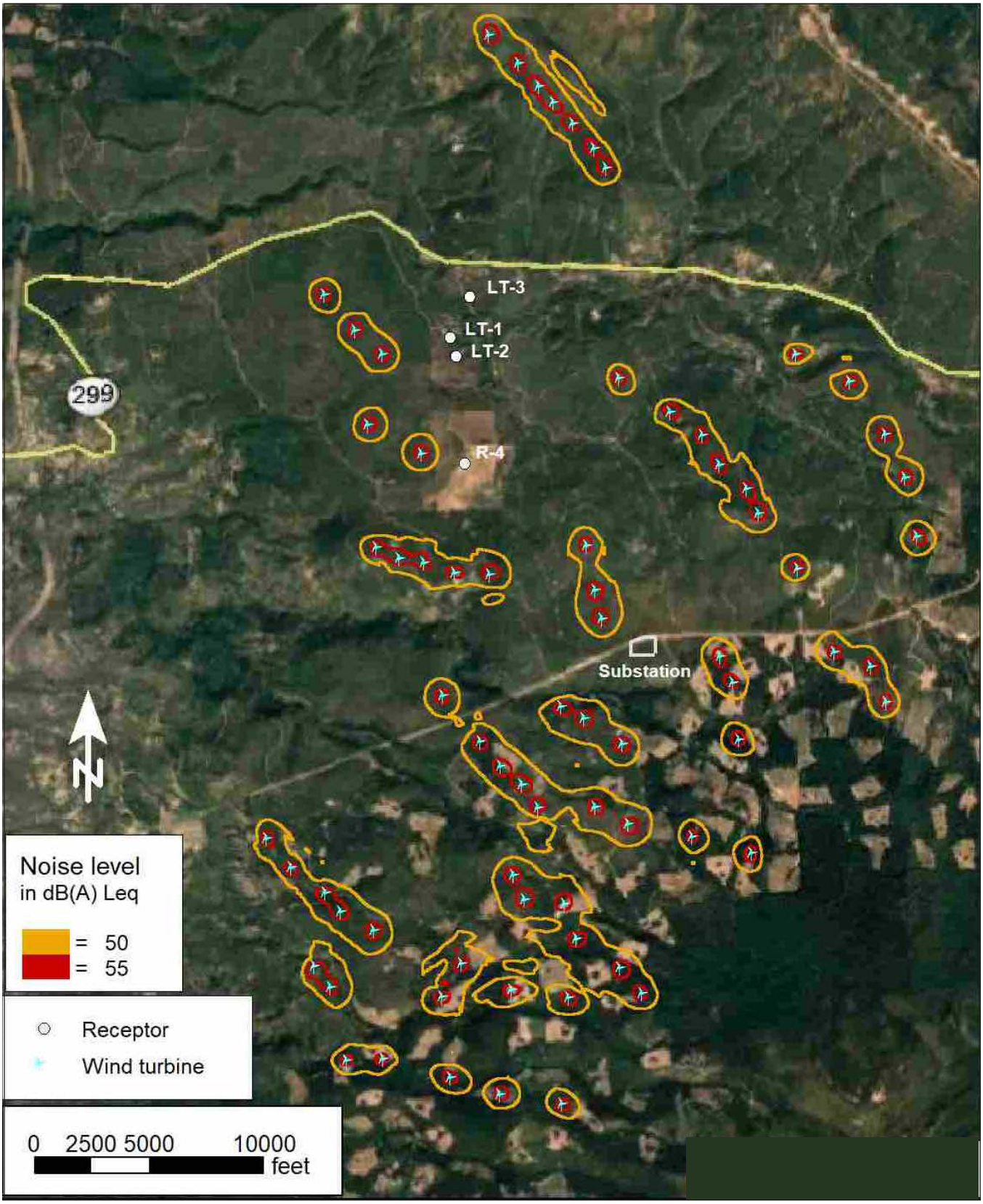
Source	Predicted Noise Level (dBA L_{eq})			
	Receptor LT-1	Receptor LT-2	Receptor LT-3	Receptor R-4
Existing hourly average noise level (daytime / nighttime)	40/36	38/34	47/46	42/42
Wind Turbine Operations[1]	40	40	38	43
Substation Noise[1]	13	13	13	13
Corona Noise[1]	21	21	21	21
Maintenance Activities[2]	38	38	36	41
Total Operational Noise During Nighttime Hours	40	40	38	43
Existing plus Total Operational Contribution During Nighttime Hours	41	41	47	46
Nighttime Standard	50	50	50	50
Total Operational Noise During Daytime Hours	42	42	40	45
Existing plus Total Operational Contribution During Daytime Hours	44	43	48	47
Daytime Standard	55	55	55	55

NOTES:
1 Source operates during daytime and nighttime hours.
2 Source operates during daytime hours only.

SOURCE: Appendix H

The closest residences to any single turbine are located about 2,200 feet away. Given the long propagation distances and terrain between the turbines and the closest receptors, turbine sound would be subject to additional attenuation by shielding from intervening terrain, atmospheric absorption, ground absorption, and variations in temperature and wind.

Three-dimensional modeling was conducted to account for site characteristics and topography assuming a worst-case condition with operation of all wind turbines simultaneously. The results of this modeling effort are shown in the noise level contours presented in **Figure 3.13-3**, *Noise Contours for Turbine Operations*. These contours represent the predicted 50 dBA L_{eq} and 55 dBA L_{eq} sound levels surrounding each turbine or group of turbines. Receptor locations were placed within the model to be representative of the residences facing the closest turbine at a distance of 100 feet from the residential structure, consistent with General Plan Policy N-b. For Receptors LT-1, LT-2, and LT-3, these locations are the same as the ambient measurement locations. The fourth receptor (R-4) is a location representative of the receptor to the south of monitoring location LT-4.



SOURCE: Illingworth & Rodkin, Inc.

Fountain Wind

Figure 3.13-3
Noise Contours for Turbine Operations

The calculated noise levels at each of the nearest existing noise sensitive receptors under this same worst-case scenario are shown in **Table 3.13-7**, *Predicted Sound Pressure Levels at Residential Locations Near Proposed Turbine Sites*, which shows the predicted A-Weighted L_{eq} and L_{dn} levels for each receptor location are indicated in Figure 3.13-2.

TABLE 3.13-7
PREDICTED SOUND PRESSURE LEVELS AT RESIDENTIAL LOCATIONS NEAR PROPOSED TURBINE SITES

Receiver Location	Existing Noise Level L_{eq}, dBA	Predicted Turbine Contribution L_{eq}, dBA	Resultant Nighttime Noise Level L_{eq}, dBA	Shasta County Nighttime Standard (L_{eq})
LT-1	36	40	41	50
LT-2	34	40	41	50
LT-3	46	38	47	50
R-4	42	43	46	50

NOTE: 1. 24-hour L_{dn} metric assumes continuous, simultaneous operation of all turbines 24 hours per day.

SOURCE: Illingworth and Rodkin, 2019.

As indicated in Table 3.13-7, worst-case wind turbine operation would contribute L_{eq} noise levels less than the 50 dBA nighttime noise standard of the Shasta County General Plan at all four of the nearest residential receptor locations.

While noise levels would be consistent with the standards established by the General Plan, turbine operations would result in modest increases over existing average ambient nighttime noise at the nearest receptors, given the relatively low existing nighttime noise levels. However, noise increases at all receptors would range from 1 to 8 dBA L_{eq}, assuming 100 percent operations during nighttime hours. This increase in nighttime ambient noise would be perceptible (5 dBA or greater) at receptor LT-1 and LT-2. More likely assumptions, for example, assuming 50 to 85 percent operations during the 24-hour period, would result in lower Project generated nighttime L_{eq} levels and thus lower noise level increases at residences. Likewise, selection of a turbine with a lower noise level would result in lower Project generated nighttime L_{eq} levels and thus lower noise level increases at residences.

While turbine noise may be perceptible to the nearest receptor during the quietest nighttime hours, worst-case turbine operations would generate noise levels less than County General Plan standards; and therefore the Project would result in a less-than-significant impact with respect to generation of a permanent increase in ambient noise levels near the Project in excess of County General Plan standards.

Infrasonic Turbine Noise Impacts

Operation of wind turbines also can produce low-frequency infrasonic noise. As discussed in Section 3.13.3.1, *Methodology*, while Shasta County has not established exposure standards for ultrasonic noise, an available source of low frequency criteria within the State of California is found within the Kern County Code (Kern County, 2006). Under this criteria, the low frequency noise levels at 50 feet from a residence are shown in Table 3.13-4. In the infrasonic range (below

20 Hz), the Kern County criteria are actually lower than the established threshold of hearing by 18 to 37 dB (USEPA, 1973). As a result, achieving the values shown for the Kern County criteria would assure that any infrasonic noise generated by the Project would be sufficiently low in level to avoid any infrasonic noise impact.

Spectral data for the worst-case wind turbine scenario were used to determine the differences between the A-Weighted and C-Weighted levels at each receptor location as presented in **Table 3.13-8**, *Difference Between A-weighted and C-weighted Predicted Noise Levels*. As shown in the table, the difference between the A-Weighted and C-Weighted levels are anticipated to be 17.7 to 19.5 dB. These differences are below the 20 dB threshold of concern for low frequency noise relative to A-weighted levels. Levels are also 5 dB or more below the Kern County thresholds shown in Table 3.13-4 and the standard condition of approval that has been used in Alameda County (70 dBA, dBC). As a result, low frequency noise that would be generated from the turbines is predicted to be below any of these three available regulations or guidelines, based on the predicted A-weighted sound level limits.

TABLE 3.13-8
DIFFERENCE BETWEEN A-WEIGHTED AND C-WEIGHTED PREDICTED NOISE LEVELS

Receiver	A-Weighted L_{eq}, dBA	C-Weighted L_{eq}, dBC	L_{dn}[1], dBA	L_{dn}[1], dBC	dBC – dBA dB
LT-1	39.5	58.4	46	65	18.9
LT-2	39.5	58.5	46	65	19.0
LT-3	38.2	57.7	45	64	19.5
R-4	43.3	61.0	50	67	17.7

NOTES:
1 Assumes continuous simultaneous operation of all turbines, 24-hr/day.
2 Results were rounded to the nearest decibel. In some cases, this can result in relative changes that may not appear intuitive. For example, the difference between 64.4 (64) and 64.5 (65) is 0.1 (0), not 1.

SOURCE: Illingworth and Rodkin, 2019.

Substation and Switching Station

An onsite collector substation and switching station would increase the voltage of the electricity from the collection system's 34.5 kV to 230 kV to match the voltage of the existing PG&E 230 kV line that would be connected to the substation. The closest existing residential areas (R-4) are 1.5 miles to the northwest from the substation location (see Figure 3.13-3). The basic elements of the substation facilities include a control house, a bank of one or two main transformers, outdoor breakers, capacitor banks, relaying equipment, and overhead lightning-suppression conductors.

The primary operational noise sources proposed at the substation are anticipated to be transformers. A typical transformer is estimated to generate a noise level of 72 dB at a distance of 6 feet during full load with fans and pumps running (Appendix G). With two transformers running simultaneously, the noise level would be 3 dB higher, at 75 dB. Based on noise measurements made at the Bridgeville 115 kV Substation in Humboldt County, California, steady state noise levels in the range of 47 to 54 dBA L_{eq} would be anticipated at the fence line of the

substation. These levels are consistent with those modeled for 230 kV substations (SDGE, 2016). Equipment-generated noise levels drop off at a rate of about 6 dBA per doubling of the distance between the source and receptor. Shielding by buildings or terrain can provide an additional 5 to 10 dBA or more noise reduction at distant receptors. At a distance of 1.5 miles, substation noise would be less than 15 dBA and inaudible even at the quietest nighttime hours. There would be no impact associated with the generation of substation transformer noise.

Corona Noise

The Project would include 34.5 kV overhead collection lines and a 230 kV transmission connection line. The short 230 kV line interconnection to the existing PG&E 230 kV system would be installed from the substation. The 34.5 kV collection lines would run north to south within the Project Site. Computer modeling software developed by the Bonneville Power Administration was used to calculate audible noise that would be associated with transmission line corona activity. This modeling indicates that, during wet-weather conditions, audible noise levels of up to 46 dBA would occur within the right-of-way for a transmission line operating at 230 kV. Corona noise from the lower voltage collection lines would be lower.

At the closest residence, located more than 2,000 feet from the proposed lines, noise levels from the 230 kV lines would be 25 to 35 dBA lower than the levels within the right-of-way, resulting in levels that would be well below ambient noise levels, and inaudible even at the quietest nighttime hours. There would be no impact associated with the generation of corona noise.

Operation and Maintenance Activities

Operation and maintenance activities generally would occur during normal workday hours from Monday to Saturday and would require up to 12 full time employees. Scheduled maintenance may require the use of a crane within a 95-foot diameter area around the turbines. Permanent access roads would be periodically graded and compacted in order to minimize erosion. Catch basins, roadway ditches, and culverts would be cleaned and maintained regularly.

The addition of 12 vehicles spread throughout the existing logging roadway network within and near the Project Site would not be anticipated to measurably change the noise environment (increase would be less than 1 dBA L_{dn}). Maintenance operations would be located as close as 2,000 feet from existing residences. Maintenance noise levels were calculated using the Federal Highway Administration's Roadway Construction Noise Model. A crane is calculated to generate a maximum instantaneous noise level of 49 dBA L_{max} and 41 dBA L_{eq} at a distance of 2,000 feet, not taking into account any noise reduction from intervening shielding by structures or terrain. Maintenance operations would be occasional at each individual turbine, with servicing occurring only twice a year. Although maintenance operations may occasionally be audible during quiet daytime ambient conditions when located nearest noise sensitive locations, ambient noise levels would not be affected on an hourly or daily average basis. The noise impact from operational and maintenance impacts would be less than significant.

Mitigation: None required.

Impact 3.13-2: Construction, decommissioning, and site reclamation of the Project could result in the generation of a substantial temporary increase in ambient noise levels on and near the Project Site in excess of standards established in the Shasta County General Plan or the applicable standards of other agencies. (*Less than Significant with Mitigation Incorporated*)

The Project construction period would last up to 24 months. Proposed decommissioning of existing facilities and infrastructure and reclamation of the Project Site also would require up to 24 months and conservatively is assumed to generate the same noise levels as during construction. Construction generally would be conducted during daytime hours, typically from 7:00 a.m. to 5:00 p.m. However, there may be circumstances where construction hours would need to be extended earlier or later, such as during the delivery of unusually large loads, and nighttime construction may occur to avoid traffic, adjust for high winds during daylight hours, and/or to stay on schedule. The construction workforce is estimated to include up to 400 construction workers at any given time.

Project construction activities would include timber clearance and harvesting, site grading, widening of existing roads and construction of new access roads, transportation of turbine components, clearing of laydown areas, construction of turbine foundations, assembly and erection of turbines, construction of the substation and O&M Building, installation of the underground and overhead collection system, and installation of the transmission line connection. Helicopters may be used to string the overhead collector and transmission connection lines.

As described in Section 2.4.5.1, *Site Preparation*, blasting may be required in advance of excavation for the installation of trenches, for example, depending on the subsurface conditions. If blasting is necessary, the Applicant would prepare a Blasting Plan that identifies the locations where blasting would be anticipated to be needed and all applicable regulations for blasting procedures. The Blasting Plan also would specify the times and distances where explosives would be permitted to avoid impacts on sensitive environmental receptors and the human environment. This EIR assumes that the Applicant's contractor(s) would comply with the most stringent provisions of applicable federal, State, and local laws governing explosives, and that the plan would address safety measures that avoid or minimize impacts to nearby residents (e.g., from vibration or noise).

While the initial phases of construction would include timber clearance and harvesting, the potential for these activities is part of the existing baseline condition, since the current use of the Project Site is managed forest land. Thus, this activity would not represent a new noise source. The main sources of construction noise that would be associated with the Project are described below.

Off-Road Construction Equipment

During each stage of construction, there would be a different mix of equipment operating and noise levels generated at a given receptor would vary by stage and vary within stages, based on the amount of equipment in operation and the location where the equipment would be operating. Typical construction noise levels at 50 feet for equipment likely to be used in the construction of the Project are shown in Table 3.13-5. Most construction activities at a wind turbine facility generate noise levels in the range of 80 to 85 dBA L_{max} at 50 feet from the source. Hourly average

noise levels would also be in the range of 80 to 85 dBA L_{eq} during periods of heavy construction. Construction-generated noise levels attenuate at a rate of approximately 6 dBA per doubling of the distance between the source and receptor. Shielding by terrain can provide further reductions of up to 20 dBA at distant receptor locations.

The closest residences to Project work areas are located approximately 2,000 feet from turbine construction areas. At this distance, hourly average noise levels from heavy construction activities would be in the range of 48 to 53 dBA L_{eq}, not taking into account any shielding from intervening terrain. These noise levels could, at times, be audible at receptors, particularly if nighttime construction activities are required, but would not be anticipated to cause sleep or speech interference or substantially affect the overall ambient noise levels at these locations. Construction activities at any individual turbine location would be limited to a relatively short period of time as construction proceeds from one turbine site to another throughout the Project Site.

Because substation and O&M Building construction would be located approximately 0.6 mile from the nearest existing receptors on Moose Camp Road (LT-3), construction noise levels from construction of these Project elements would be approximately 45 dBA L_{eq} and would not be distinguishable from average ambient daytime noise levels (47 dBA L_{eq}).

Roadway construction activities could occur as close as 580 feet and 1,170 feet from the nearest residences, LT-2 and R-4, respectively. At a distance of 580 feet, noise from heavy construction activities would be in the range of 59 to 64 dBA L_{eq}, not taking into account any shielding from intervening terrain. At 1,170 feet, noise from heavy construction activities would be in the range of 53 to 58 dBA L_{eq}. Given that nighttime construction may occur to avoid traffic, the potential for nighttime roadway construction would primarily occur at the two SR 299 access points which are over 2,500 feet from the nearest receptor. Roadway construction typically would occur for relatively short periods of time at any specific location as construction proceeds along the roadway. Although construction activities that would be located nearest to the residences would not be expected to cause sleep or speech interferences, noise levels could exceed ambient levels by as much as 20 dBA at LT-2 when construction occurs at the closest point.

Construction Truck Trips

Construction traffic entering the Project Site would include vehicle trips by construction workers, and truck trips for material delivery, removal of harvested timber, and equipment delivery. All traffic would reach the site using SR 299. Three access roads are proposed to coincide with existing logging roads at the intersections with SR 299. Based on the available traffic volumes from Caltrans, SR 299 has an existing peak hour traffic volume of about 320 vehicles per hour with a truck percentage of over 13 percent.

During construction, the Project would employ an estimated 400 construction workers, Project management staff, equipment operators, survey staff, and delivery vehicle drivers during the peak period, with the average number of workers on-site in the range of 325 workers. The material delivery vehicle trips would be spread out throughout the day. The maximum number of aggregate deliveries per day would be approximately 90 deliveries (180 trips), constrained by the loading and unloading times. The maximum number of concrete deliveries per day would be approximately

50 deliveries (100 one-way trips), constrained by the rate that ready mix plants can batch concrete, and the rate the contractor can unload trucks. The estimated total number of construction trips occurring over the up to 24-month construction period is projected to be 93,088 trips.

Construction traffic volumes were provided in the Project's transportation study (Appendix H), which were used to calculate an estimated Project construction-related traffic noise increase of about 2 dBA L_{dn} on SR 299 in the vicinity of the Project Site (Appendix H). This increase would be below the County's 3 dBA L_{dn} and 5 dBA L_{dn} thresholds for noise increases due to permanent Project operations.

Construction traffic peak hour volumes on the existing logging roads are anticipated to increase from 24 to 40 trips on the west access road, 12 to 128 trips on the north access road, and 12 to 273 trips on the east access road which would occur during daytime hours when primary aggregate transport would occur. Assuming a worst-case analysis with 50 percent of these vehicles (both existing and Project construction vehicles) being heavy trucks, the calculated noise levels at a distance of 50 feet from the center of the road would be 58 dBA L_{eq} on the west access road, 63 dBA L_{eq} on the north access road, and 66 dBA L_{eq} on the east access road.

Existing ambient noise levels at receptors along local access roads are below 60 dBA L_{dn}; therefore, the 5 dBA increase threshold established by General Plan Policy N-g would apply. The closest residence to the west access road (represented by LT-1) is located about 300 feet from the center of the road. At this distance, the peak hour noise level generated by the Project's 28 construction-related trips (14 light vehicles and 14 heavy trucks) would be 44 dBA L_{eq}. The existing daytime peak hour noise level at this residence ranges from 43 to 49 dBA Leq (see Appendix G). The resulting peak hour noise levels with combined ambient and Project construction traffic noise levels would be 47 to 50 dBA L_{eq}. This would equate to a 1 to 4 dBA L_{eq} noise increase above existing ambient levels, which would be below the 5 dBA L_{dn} threshold and therefore less than significant.

If construction activities were required during nighttime hours when existing traffic levels are lower, the resulting combined nighttime ambient and Project construction traffic noise level would exceed the ambient nighttime noise level at the closest residence (average of 36 dBA L_{eq}; see Table 3.13-2) by more than the 5 dBA L_{dn} threshold, which would be a significant impact. Construction traffic could be redirected from the west access road to use alternative access routes such as the north and east access roads to avoid construction-related noise near residential uses. There are no noise sensitive receptors adjacent to the north and east access roads, therefore use of these roads, even during night time hours, would not exceed ambient noise standards for residential uses. **Mitigation Measure 3.13-2** (Noise-Reducing Construction Practices) identifies alternative truck routes to reduce noise impacts to receptors located along the west access road to address this potential roadway noise increase.

Helicopter Noise

Helicopters may be used to string overhead collector lines. Helicopter overflights could generate noise levels of up to 100 dBA at a distance of 100 feet. Helicopter overflights and activities would be intermittent and would not be located at a single location for any extended period. Noise levels, would be approximately 74 dBA at 2,000 feet. This noise level would be anticipated

to cause speech interference outdoors (exceed 70 dBA L_{eq}) and sleep disturbance indoors, assuming a 15 dBA exterior-to-interior noise reduction with windows partially open. Therefore, temporary noise from helicopters is identified as a potential significant impact if required for stringing of collector lines. **Mitigation Measure 3.13-2** (Noise-Reducing Construction Practices) identifies restrictions on helicopter operations to reduce this potential significant construction-related impact to a less-than-significant level.

Blasting Noise

Controlled blasting could generate noise levels of up to 94 dBA (L_{max}) at a distance of 50 feet for an event of less than 20 seconds in duration. Blasting events typically occur between one and ten times per day and each blast would be preceded by drilling noise for up to one hour. At the closest residences to the nearest potential blasting location, 2,000 feet from the nearest wind turbine construction area, peak overpressures of about 117 dB(L) would be anticipated, which are well below the 133 dB(L) criteria to avoid damage. Peak overpressure is controlled by charge confinement. The standard procedure for confining the charge is to place the explosives deep in the drilled blast hole and then to backfill the remainder of the hole with crushed rock. Assuming standard blast confinement techniques are used, Project-related damage from acoustic overpressures is not expected for any residence. Although these low frequency overpressures could potentially be audible, the Shasta County noise criteria do not apply to this type of impulsive noise and that is why the 133 dB(L) criteria of the regulatory limit defined by the former US Bureau of Mines is applied. While residents may occasionally hear sounds from blasting events, these sounds would occur on an infrequent basis during construction. These brief intermittent events would not be expected to substantially increase hourly average or daily average noise levels. While blasting typically is conducted during daytime activities, **Mitigation Measure 3.13-2** (Noise-Reducing Construction Practices) identifies restrictions on blasting activities to ensure that they are only conducted during daytime hours,

Impact Summary

In summary, Project construction would result in a potential significant impact if truck delivery of construction materials occurred during nighttime hours via the west access road and, separately, as a result of the proposed use of helicopters to string overhead collector. The implementation of Mitigation Measure 3.13-2 (Noise-Reducing Construction Practices) would reduce this potential significant impact to a less-than-significant level.

> **Mitigation Measure 3.13-2: Noise-Reducing Construction Practices.**
>
> The Project Applicant shall ensure that the following measures are implemented during construction, decommissioning, and site reclamation activities to avoid and minimize construction noise effects on sensitive receptors:
>
> a) Construction vehicle routes shall be located at the most distant point feasible from noise-sensitive receptors.
>
> b) All heavy trucks shall be properly maintained and equipped with noise-control (e.g., muffler) devices, in accordance with manufacturers' specifications, at each work site during Project construction, decommissioning, and site reclamation to minimize heavy truck traffic noise effects on sensitive receptors.

c) Haul trucks and delivery trucks shall prioritize use of the east access road, if available, over the west access road, and shall avoid use of the west access road during nighttime hours.

d) Helicopter use shall be limited to a period of 2 weeks or less such that receptors are not impacted for a substantial period of time.

e) Limit construction operations located within 2,500 feet of residences to daytime hours only.

f) Residences within 2,000 feet of helicopter activity shall be notified of the timeline of proposed operations at least 2 weeks` prior to line stringing operations.

g) Nighttime (10 p.m. to 7 a.m.) helicopter use and blasting shall be prohibited.

Significance after Mitigation: The above construction noise reduction measures would reduce potential impacts related to truck noise along the west access road, reduce the severity of noise from helicopter operations, and would represent best management practices to reduce construction-related noise, in general.

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b) Whether the Project would result in the generation of excessive groundborne vibration or groundborne noise levels.

Impact 14.3-3: Construction, decommissioning, and site reclamation of the Project could generate groundborne vibration. (*Less than Significant with Mitigation Incorporated*)

When blasting occurs at large distances from sensitive structures, the primary concern is the potential for cosmetic damage to structures. Cosmetic damage (e.g., minor cracking in plastered walls) can occur as a result of ground-borne vibration or acoustic overpressures. Vibration from blasting events on the Project Site were calculated using methods established by the former U.S. Bureau of Mines and are presented in **Table 3.13-9**, *Ground Vibration Levels Generated by Blasting*. As discussed in Section 3.13.3.1, *Methodology*, predicted vibrations levels are compared to more conservative limit of 0.3 in/sec PPV published by Caltrans.

TABLE 3.13-9
GROUND VIBRATION LEVELS GENERATED BY BLASTING

Distance (feet)	Blasting Level (in/sec PPV) for Various Explosive Charge Weights per Delay (lbs)		
	175 lbs	350 lbs	700 lbs
2,000	0.098	0.170	0.296
3,000	0.051	0.089	0.155
4,000	0.032	0.056	0.098

Blasting could occur as close as 2,000 feet from existing residential areas. Calculated ground vibration levels are summarized in Table 3.13-9 for a variety of charge weights and distances. Receptors located further from blasting activities would experience lower vibration levels.

As shown in Table 3.13-9, blasting, using a charge weight of 700 lbs/delay[8] within 2,000 feet of sensitive structures, could generate groundborne vibration levels as high as 0.296 in/sec PPV, which would be just below the 0.3 in/sec PPV Caltrans threshold. Consequently, use of charge weights in excess of 700 pounds per delay could result in significant vibration impacts.

Mitigation Measure 3.13-3: Charge Weight Limits on Blasting Activities.

The Project Applicant shall ensure that blasting contractors restrict charge weight per delay such that a performance standard of less than 0.3 in/sec PPV would result at any structures in the vicinity of the blasting area. This performance standard shall be established as a condition of contract and implemented by a licensed blasting contractor in possession of a Federal Explosives License/Permit, issued by the Bureau of Alcohol, Tobacco, and Firearm.

Significance after Mitigation: Structures closest to potential blast areas would be unlikely to experience any level of cosmetic or structural damage, assuming a maximum vibration level of less than 0.3 in/sec PPV. Vibration levels would be lower at locations further from blasting or when lower charge weights are used. Consequently, with the application of Mitigation Measure 3.13-3, blasting activities associated with construction of the Project would have a less-than-significant impact with respect to generation of groundborne vibration that would exceed the criteria established by Caltrans.

3.13.3.3 PG&E Interconnection Infrastructure

As described above in Impact 3.13-1, the onsite collector substation and switching station where the PG&E transmission line interconnect would be located would be approximately 1.5 miles from the closest existing residential area (R-4). The primary operational noise source that would be associated with the proposed transmission line connection at the substation would be corona noise, which would be up to 46 dBA within the transmission line connection right-of-way. At 1.5 miles, the corona noise level associated with the transmission line connection would not be audible. Consequently, there would be no operational impact of the PG&E interconnection infrastructure.

Similarly, the substantial distance between the transmission line connection from the nearest receptor would serve to attenuate construction-related noise and noise from decommissioning and site reclamation. Impact 3.13-2, above, assess potential impacts occurring from construction activities at the nearest receptor located approximately 2,000 feet away. Given that the transmission line connection would be on the order of 7,900 feet away, noise levels from construction, decommissioning, and site reclamation would be expected to be approximately 12 dBA, which would be inaudible. With regard to traffic noise levels along the west access road, the daily truck trips that would be required to deliver the materials for the four to six new transmission poles and associated conductor would not be expected to result in a traffic noise level that would exceed the ambient nighttime noise level at the closest residence by more than

8 The maximum quantity of explosive charge detonated on one interval (delay) within a blast.

the 5 dBA L_{dn} threshold. The construction impact associated with the PG&E interconnection infrastructure would be less than significant.

3.13.3.4 Direct and Indirect Effects of Alternatives

Alternative 1: South of SR 299

Under Alternative 1, the Project would be constructed, operated and maintained, and ultimately decommissioned as proposed south of SR 299, but none of the up to seven turbines proposed to the north of SR 299 or their related infrastructure would be developed. These seven northerly turbines would have been located over 5,000 feet from the nearest receptor (LT-3) and, as indicated in Figure 3.13-3, would contribute substantially less than 50 dBA to the nearest receptors during operations. Given that the primary contributors to both construction-related and operational noise and vibration impacts would be related to turbine locations south of SR 299, both construction-related noise and vibration impacts, and operational noise and vibration impacts of Alternative 1 would be the same as those identified above for the Project, less than significant with implementation of Mitigation Measure 3.13-2 (Noise-Reducing Construction Practices).

Alternative 2: Increased Setbacks

Under Alternative 2, proposed setbacks would be increased relative to the Project to preclude turbine construction within 2,037 feet of a residential property line and within 1,018.5 feet of SR 299, any other publicly-maintained public highway or street, and of Supan Road or Terry Mill Road. Implementation of these setbacks would preclude construction of proposed turbines M03, D05, and B01 based on the residential property line setback, and would preclude construction of turbine KO2 based on the roadway setback. The effect of eliminating these turbines, in particular turbine D05, would reduce the operational and construction-related noise levels at receptor location R-4 compared to those identified for the Project. Impacts would be the same as those identified above for the Project, less than significant with implementation of Mitigation Measure 3.13-2 (Noise-Reducing Construction Practices).

No Project Alternative

If the No Project Alternative is implemented, none of the proposed wind turbines and associated transformers or other infrastructure, facilities or structures would be constructed, operated and maintained, or decommissioned on the Project Site. The proposed overhead electrical lines would not be developed; and the onsite collector substation, switching station, and operation and maintenance (O&M) facility would not be constructed, visited pursuant to operations and maintenance activities, or demolished and removed from the Project Site. Laydown areas would not be cleared, no new access roads would be constructed, and no existing roads would be improved or traveled. The Project Site would continue to be operated as managed forest timberlands. Because there would be no change relative to baseline conditions, the No Project Alternative would create no impact related to noise or vibration.

The Project Site is zoned for timber production. Pursuant to regulations implementing the California Timberland Productivity Act (Government Code §51100 et seq.; 14 Cal. Code Regs.

§897[a]), there is a legal presumption that "timber harvesting is expected to and will occur on such lands." The regulations further specify that timber harvesting on such lands "shall not be presumed to have a Significant Adverse Impact on the Environment" (14 Cal. Code Regs. §898). Therefore, the No Project Alternative, including anticipated timber harvesting, is not presumed to result in a significant adverse individual or cumulative effect relating to noise or vibration. CAL FIRE would review any future timber harvesting proposal to evaluate any potential project-specific, site-specific environmental impacts.

3.13.4 Cumulative Analysis

The above Project-level analysis indicates that beyond a distance of approximately 3,000 feet, construction-related noise and vibration impacts would be attenuated to ambient levels. Therefore, this distance is also applied to the perimeters of the turbine locations and receptors to determine the geographic scope of potential cumulative impacts. There are six timber harvest plans within the leasehold area that are active or in preparation, but all six of these harvest plans are more than 5,000 feet from the nearest receptor and so are outside of the geographic scope of potential cumulative impacts.

Additionally, there is a Caltrans roadway improvement project on SR 299 scheduled for 2021, approximately 3,000 feet from the nearest turbine and 300 feet from the nearest receptor (LT-3). Construction activities of this Caltrans project could occur simultaneously with the earliest stages of Project construction and, as a linear construction project, may occur proximate to a given roadside receptor for a period of 1 to 2 weeks. As discussed above, construction equipment involved with the Project would generate noise levels of 48 to 53 dBA L_{eq} at 2,000 feet, not taking into account any shielding from intervening terrain and would result in a less-than-significant impact. Receptor LT-3 is located approximately 4,000 feet from the nearest turbine construction areas and would experience noise levels of 42 to 47 dBA L_{eq}. Construction work associated with the Caltrans project at a distance of 300 feet would be expected to generate noise levels of 65 to 70 dBA L_{eq}. Using the upper end of these estimates, the cumulative combination of 47 dBA and 70 dBA L_{eq} would result in a noise level of 70.4 dBA L_{eq}. Therefore, the Project would not contribute considerably to the noise generated by the Caltrans project, regardless if occurring during daytime or nighttime hours. With regard to vibration, the vibration levels that would be associated with construction of the Caltrans project would not be expected to be perceived at a distance of 300 feet. Therefore, the vibration levels that would be associated with the Project blasting activities would not combine with those of the Caltrans project to result in a significant cumulative impact because the cumulative noise and vibration increases would be well below the level of human perception. No significant cumulative effects would result. The cumulative impact would be less than significant.

3.13.5 References

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3.14 Transportation

This section identifies and evaluates issues related to Transportation in the context of the Project and alternatives. It includes information about the physical and regulatory setting and identifies the criteria used to evaluate the significance of potential impacts, the methods used in evaluating these impacts, and the results of the impact assessment. The information and analysis presented in this section are based in part on data provided in **Appendix H**, *Transportation*. The County independently reviewed this and other materials prepared by or on behalf of the Applicant and determined them to be suitable for reliance on (in combination with other materials included in the formal record) in the preparation of this Draft EIR.

In response to its notice of intention to prepare this Draft EIR, the County received scoping input noting that State Route (SR) 299 is narrow, of steep grade in the Project area, and subject to commercial accidents on a regular basis. Input received also identified a road located within 100 feet of Moose Camp that provides the owner of the Lammer Ranch access to SR 299, and that has provided emergency ingress/egress for residents of Moose Camp since the 1930s; this road was described as "seldom used."

Scoping input also was provided about the potential for the Project to result in impacts to transportation during construction, operation, and maintenance. During construction, potential impacts could result from the number and size of vehicles needed to transport and deliver turbine components and gravel. Delays could adversely affect emergency vehicles trying to get through town; local users of SR 299 and adjoining roads; and commuters heading to Redding for work, entertainment or shopping. Commenters requested that the analysis consider delays during the time to repair SR 299 post-materials delivery, if required. Potential impacts during operation and maintenance were identified as being caused by members of the general public wanting to get up close to the turbines (as they do for the Hatchet Ridge Wind Project), regular traffic to/from the operation and maintenance facility and use of the main road proposed between the two substations, which abuts residential property.

All scoping input received, including regarding Transportation, is provided in Section 4.1 of the Scoping Report, a copy of which is provided in **Appendix J**, *Scoping Report*.

3.14.1 Setting

3.14.1.1 Study Area

For the purposes of the transportation analysis, the Project study area is defined as transportation facilities that would be used to transport workers and materials to/from the Project Site during construction, operation and maintenance, and decommissioning and site restoration. These include roadways located directly adjacent to the Project Site (i.e., SR 299, Moose Camp Road, and three existing, gated logging roads that would be used for Project access) as well as regional facilities that provide access to SR 299, which include Interstate 5 (I-5) approximately 35 miles west of the Project Site, and SR 139 approximately 60 miles east of the Project Site.

3.14.1.2 Environmental Setting

Existing Roadway Network

Regional Access

SR 299 is an east-west state highway that connects I-5 and Redding to the west with SR 139 to the east. In the vicinity of the Project Site, SR 299 consists of one travel lane in each direction, and paved shoulders.

I-5 is a north-south interstate highway that extends from the Mexican border to the Canadian border and provides access for goods movement, shipping, and travel. Access to the Project Site from I-5 is provided via an interchange with SR 299 on the north end of Redding. At this location, I-5 consists of two travel lanes in each direction, and paved shoulders.

SR 139 is a north-south state highway that connects Susanville to the south with the Oregon state border. Access to the Project Site is provided via an interchange with SR 299 in the town of Adin.

Local Access

Three existing access roads currently used for logging that intersect with SR 299 would provide local access to the Project Site. See Figure 2-5, *Road Network*, in Chapter 2, *Description of Project and Alternatives*). The West Access is proposed along a road called G Line, which intersects with SR 299 approximately 37 miles east of the interchange with I-5 in Redding. There is a widened shoulder at this intersection, but no turn lanes. The North Access is approximately 3 miles east of the West Access. This access is proposed along an existing and unnamed logging road that intersects SR 299 just east of Little Hatchet Creek. As with the West Access, there is a widened shoulder at this access, but no turn lanes. The East Access is approximately 2 miles east of the North Access and approximately 8 miles west of Burney. This access is proposed along an existing and unnamed logging road that provides access to the area south of SR 299. As with the other access points, there is a widened shoulder at this access, but no turn lanes.

Traffic Volumes

Annual average daily traffic (AADT) volumes and average peak-hour traffic volumes on SR 299 are shown in **Table 3.14-1**, *SR 299 Traffic Volumes – Existing Conditions*. According to the latest traffic data available from the California Department of Transportation (Caltrans), urban centers on each end of SR 299 record the highest traffic volumes, then diminish significantly in the rural and mountainous areas in between (Caltrans, 2017). Between I-5, in Redding and Plumas Street, in Burney, nine daily and peak-hour count locations are listed.

The highest existing AADT on SR 299 is 21,000 vehicles per day at I-5 in Redding, where the highway has a four-lane freeway alignment. The peak-hour volume is 2,150 vehicles per hour. On the two-lane rural section of SR 299 between Deschutes Road (on the east edge of Redding) and Elm Street (on the west edge of Burney), the peak-hour volume ranges from between 320 and 490 vehicles per hour.

TABLE 3.14-1
SR 299 TRAFFIC VOLUMES – EXISTING CONDITIONS

Location	Milepost (start – end)	Existing AADT	Existing Peak-Hour Volume
I-5 Junction (Redding)	24.8	21,000	2,150
Between I-5 and Hawley Road	24.9 - 25.5	11,600	1,150
Between Hawley Road and Old Oregon Trail	25.5 - 27.2	9,700	940
Between Old Oregon Trail and Deschutes Road	27.2 - 31.5	4,850	490
Between Deschutes Road and Terry Mill Road	31.5 - 53.3	3,650	360
Between Terry Mill Road and Big Bend Road	53.3 - 60.1	2,850	320
Between Big Bend Road and Tamarack Road	60.1 - 73.1	3,000	320
Between Tamarack Road and Elm Street	73.1 - 74.5	3,300	370
Between Elm Street and Plumas Street (Burney)	74.5 - 75.0	8,400	880

SOURCES: Appendix H; Caltrans, 2017.

The three Project access roads are located within the segment of SR 299 between Big Bend Road and Tamarack Road. The AADT and peak-hour volumes for this segment are 3,000 vehicles per day and 320 vehicles per hour, respectively. Heavy vehicle traffic constitutes a notable percentage of the background traffic on this segment of SR 299. At Mile Post 72.6, west of Burney, the heavy vehicle percentage on SR 299 was recorded in 2016 (the latest data available as 13.69 percent (Caltrans, 2016).

Level of Service

Table 3.14-2 shows the existing peak-hour level of service (LOS) for the study roadway segments on SR 299. LOS is a scale used to determine the operating quality of a roadway segment or intersection based on volume-to-capacity ratio (V/C) or average delay experienced by vehicles on the facility. The levels range from A to F, with LOS A representing free traffic flow and LOS F representing severe traffic congestion. Agencies adopt LOS standards that define the level of operations that are acceptable within their jurisdiction. Caltrans, which has jurisdiction of SR 299, has an established standard of LOS C or better (V/C of less than 0.80) for rural highways. See additional discussion in Section 3.14.3.1, *Methodology*.

According to the Highway Capacity Manual (Transportation Research Board, 2000), the base capacity of a freeway segment is 2,300 passenger cars/hour/lane; which, for a four-lane section, would equal 9,200 vehicles per hour. The base capacity of a two-lane rural roadway segment is 2,000 passenger cars/hour/lane which, for a two-lane section, would equal 4,000 vehicles per hour. The V/C was calculated using these capacities, and the 2017 average peak-hour volumes. As shown in the table, the study segments of SR 299 all currently operate with a V/C of less than 0.80, which means that they operate at LOS C or better.

TABLE 3.14-2
SR 299 PEAK-HOUR LEVEL OF SERVICE – EXISTING CONDITIONS

Location	Hourly Capacity	Existing Peak-Hour Volume	V/C	LOS C or better?
I-5 Junction (Redding)	9,200	2,150	0.23	Yes
Between I-5 and Hawley Road	9,200	1,150	0.13	Yes
Between Hawley Road and Old Oregon Trail	9,200	940	0.10	Yes
Between Old Oregon Trail and Deschutes Road	4,000	490	0.12	Yes
Between Deschutes Road and Terry Mill Road	4,000	360	0.09	Yes
Between Terry Mill Road and Big Bend Road	4,000	320	0.08	Yes
Between Big Bend Road and Tamarack Road	4,000	320	0.08	Yes
Between Tamarack Road and Elm Street	4,000	370	0.09	Yes
Between Elm Street and Plumas Street (Burney)	4,000	880	0.22	Yes

SOURCES: Transportation Research Board, 2000; Caltrans, 2017; and EIR Preparers.

Transit

The Burney Express, which is operated by the Redding Area Bus Authority, provides three weekday daily trips in each direction (three westbound, three eastbound) on SR 299. No weekend service is provided. The nearest bus stop to the Project Site is located in Montgomery Creek, approximately 6 miles west of the Project Site (RABA, 2020).

Non-Motorized Transportation

The Shasta County 2010 Bicycle Transportation Plan (Shasta County, 2010) does not identify any existing or planned bicycle facilities on SR 299 in the vicinity of the Project Site. A review of aerial imagery indicates that there are no pedestrian facilities (i.e., sidewalks, off-street trails) in the vicinity of the Project Site.

Railways

The closest railway is a single-track main line operated by Union Pacific that runs generally parallel to I-5, approximately 35 miles west of the Project Site. This line carries both passengers (via Amtrak Coast Starlight) and freight trains.

Airports

The nearest airports to the Project Site are the Fall River Mills Airport, located approximately 25 miles northeast of the site, and the Redding Municipal Airport, located approximately 35 miles southwest.

3.14.1.3 Regulatory Setting

Federal

Transportation of Hazardous Materials

The U.S. Department of Transportation (DOT) is the administering agency for the following regulations:

- Title 49 Code of Federal Regulations (CFR) Sections 171 through 177 (49 CFR §§171–177), which govern the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of transportation vehicles.
- Title 49 CFR 350–399 and Appendices A through G, Federal Motor Carrier Safety Regulations, which address safety considerations for the transport of goods, materials, and substances over public highways.
- Title 49 CFR 397.9, the Hazardous Materials Transportation Act of 1974, which directs DOT to establish criteria and regulations for the safe transportation of hazardous materials.

State

California Department of Transportation

The California Department of Transportation (Caltrans) owns the rights-of-way for state highways, including any on- and off-ramps that provide access to the Project area. Any Project-related work within the state rights-of-way would require a ministerial Encroachment Permit from Caltrans. Caltrans is also the administrating agency for regulations related to traffic safety, including the licensing of drivers, oversize/overweight vehicle limitations, transportation of hazardous and combustible materials, and the safe operation of vehicles.

Local

Shasta County General Plan

The Circulation Element of the Shasta County General Plan contains the following policies applicable to analysis of transportation facilities (Shasta County, 2004):

> **Policy C-6j:** New development shall provide circulation improvements for emergency access by police, fire, and medical vehicles; and shall provide for escape by residents/occupants in accordance with the Fire Safety Standards.
>
> **Policy C-6k:** Shasta County shall adopt the following LOS standards for considering any new roads:
>
> - rural arterial and collectors—LOS C
> - urban/suburban arterial and collectors—LOS C
>
> **Policy C-6l:** New development which may result in exceeding LOS E on existing facilities shall demonstrate that all feasible methods of reducing travel demand have been attempted to reach LOS C. New development shall not be approved unless traffic impacts are adequately mitigated.

Policy C-8b: Working in conjunction with Caltrans, the County shall designate and provide signed truck routes, ensure that adequate pavement depth, lane widths, loading areas, bridge capacities, vertical height of overpasses and utility lines, and turn radii are maintained on the designated truck routes, and prohibit commercial truck traffic from non-truck routes except for deliveries.

Policy C-8c: Adequate truck access to off-street loading areas in commercial and industrial areas shall be provided in all new development applications.

Shasta County Development Standards Manual

The Shasta County Development Standards Manual also sets specific guidelines for the construction of public road improvements and private roads, including design standards addressing slopes, widths, connection to County roads, and others (Shasta County, 1997).

3.14.2 Significance Criteria

A project would result in a significant impact to Transportation if it would:

a) Conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities;

b) Conflict or be inconsistent with CEQA Guidelines Section 15064.3(b);

c) Substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment); or

d) Result in inadequate emergency access.

Regarding criterion b), CEQA Guidelines Section 15064.3(b) was adopted in December 2018 by the California Natural Resources Agency. These revisions to the CEQA Guidelines criteria for determining the significance of transportation impacts focus primarily on projects within transit priority areas, and shift the focus from driver delay to reduction of greenhouse gas (GHG) emissions, creation of multimodal networks, and promotion of a mix of land uses. The revisions require lead agencies to evaluate transportation impacts based on vehicle miles traveled (VMT) beginning July 1, 2020. VMT is a measure of the total number of miles driven to or from a development and is sometimes expressed as an average per trip or per person. Shasta County has begun, but has not yet completed, consideration of transportation significance thresholds based on VMT. The County has not yet adopted or put in to practice VMT-based transportation significance thresholds. Where no VMT threshold has yet been adopted, the Office of Planning and Research's Technical Advisory on Evaluating Transportation Impacts in CEQA (OPR, 2018) provides guidance. In areas not near established or incorporated cities or towns, for example, the Technical Advisory notes that "significance thresholds may be best determined on a case-by-case basis." The County, based on its consideration of the potential timing for release of the Fountain Wind Project Draft EIR, determined that a significance threshold to evaluate VMT that would be generated by this Project should be used to evaluate the potential transportation impacts of this Project. For the purposes of establishing a VMT threshold for this Project, the County considered CEQA Guidelines Sections 15064(b)(2) and 15064.7 regarding the development of thresholds of significance and has determined that a performance based threshold consistent with the analysis

of the significance of the Project's GHG emissions would be appropriate. Accordingly, for purposes of this Project, an impact to VMT would be significant if it would conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs.

3.14.3 Direct and Indirect Effects

3.14.3.1 Methodology

The information and analysis presented below are based in part on data provided in Appendix H, *Transportation*. Two forms of traffic analysis were conducted for the Project. Operational analyses (i.e., LOS) were conducted for study segments of SR 299 and for the three Project access road intersections for both Project construction and Project operation. In addition, total Project-generated vehicle miles traveled (VMT) was calculated for both Project construction and Project operation. A qualitative analysis of Project decommissioning impacts is provided based on its relative impact to transportation compared with Project construction, which, from a transportation perspective, represents the maximum possible impact.

Highway Level of Service

The methodology used to evaluate existing highway LOS was also used to evaluate highway LOS for the Project. To estimate peak-hour LOS conditions, a review of historical traffic volumes for the segment of SR 299 adjacent to the Project Site was conducted, which found that peak-hour volumes have not changed appreciably over the years. Therefore, it is assumed that the existing 2017 traffic volumes identified in Table 3.14-1 would remain constant during the 18- to 24-month Project construction period as well as for Project operation and decommissioning. Based on the relative sizes of, and distances to Redding and the small towns east of the Project Site, it was assumed that 60 percent of the peak-hour background traffic would be coming to and from the west, while 40 percent would be coming to and from the east on SR 299 (Appendix H). Therefore, of the 320 peak-hour vehicle trips, 192 were assumed to approach the Project Site from the west and 128 were assumed to approach the Project Site from the east.

Intersection Level of Service

The LOS analysis measures delay per vehicle and operational performance. The LOS analysis for the three Project driveways was performed using the traffic engineering industry standard software package Synchro/SimTraffic for a.m. and p.m. peak-hour conditions for periods during and after construction. Traffic volumes for SR 299 at the driveways were developed as described above, while turning movements into and out of the driveway were developed according to the trip generation and distribution methodology described below.

Level of Service Standards

LOS standards are used to evaluate the transportation impacts of long-term growth. In order to monitor roadway operations, cities and counties adopt standards by which the minimum acceptable roadway operating conditions are determined and deficiencies may be identified. Caltrans endeavors to maintain a target LOS D at the transition between LOS C and LOS D on state highways; however, Caltrans acknowledges that this may not always be feasible and

recommends that the lead agency consult with Caltrans to determine the appropriate target LOS (Caltrans, 2002). As stated above in Section 3.14.1.3, *Regulatory Setting*, the LOS standard for County roads is LOS C as set forth in Policy C-6l of the Shasta County General Plan.

Vehicle Miles Traveled

VMT was calculated by multiplying the amount of daily traffic generated by trucks and other vehicles to haul equipment, material, aggregate, turbines, concrete, water and employees on a roadway segment by the length of the segment, then summing all the segments. Then the estimated mileage that would be logged to perform these trips during the up-to 24-month construction period was calculated.

Consistent with the materials delivery assumptions relied upon in the Project-specific traffic study (Appendix H), this analysis assumes that turbine equipment and material would be delivered from the Port of Stockton, approximately 250 miles south of the Project Site. The turbine equipment pick-up location would be finalized prior to construction, upon the selection of the turbine type to be used for the Project; however, the Port of Stockton provides a feasible and realistic turbine delivery location for the purpose of assessing transportation impacts. Otherwise, the VMT estimations were limited to the City of Redding to the west and the town of Burney to the east.

Locally sourced materials such as aggregate and water would likely come from Burney, approximately 6 miles east of the Project Site, or from pits and quarries east of Burney. If the concrete is not batched on-site, there are several concrete plants in Redding about 35 miles west of the Project Site that will likely be the source. The material delivery vehicle trips would be spread out throughout the day. The maximum number of aggregate deliveries per day would be approximately 90 deliveries, constrained by the loading and unloading times. The maximum number of concrete deliveries per day would be approximately 50 deliveries (100 one-way vehicle trips), constrained by the rate that ready-mix plants can batch concrete, and the rate the contractor can unload trucks. The maximum rate of deliveries is approximately six to eight per hour, equivalent to placing a wind turbine foundation during a single work shift.

Construction Trip Generation and Distribution

Construction period trip generation was calculated based on the types of delivery, construction, operations, maintenance and worker vehicles required during the various phases of the Project. Vehicle trips into and out of the Project Site were estimated using the projected number of deliveries, the required types of equipment and material, and the projected number of employees necessary to construct the Project over the estimated construction period. These volumes of trips were calculated using a spreadsheet that lists known phases of construction with corresponding equipment, material and numbers of employees, which are then averaged over the course of the Project.

During construction, the Project would employ an estimated 400 construction workers, project management staff, equipment operators, survey staff, and delivery vehicle drivers during the peak period, with the average number of workers on-site in the range of 325 based on preliminary schedule development. The total number of trips was determined by using the number of

employees in each of the categories listed above, dividing that number by an estimated vehicle occupancy (2.0 for survey crews; 1.5 for all other categories, except for delivery vehicles with an occupancy of 1.0) and multiplying by the number of work days for each employee category.

As a result, the number of work days and total number of trips estimated for each category in the Project-specific traffic study (Appendix H) are:

- 100 days for survey (400 total trips);
- 250 days for construction trades (24,000 total trips);
- 250 days for project management staff (2,500 total trips);
- 200 days for equipment operators (6,267 total trips);
- 250 days for small equipment on flatbed trailers (1,250 total trips); and
- 230 days for deliveries (56,079 total trips).

Thus, over the estimated 24-month construction period, the total number of all trips is estimated to be approximately 93,088 trips. Additional detail related to the construction work tasks and related delivery and construction vehicles is provided in Appendix H.

Constructing the Project would require that several tasks be repeated across the Project Site. Some sequencing of tasks is required, but many tasks may overlap across the site for efficient scheduling. For example, construction of the operations and maintenance facility, substation, switching substation, and underground and overhead collection systems could overlap with other tasks, depending on scheduling and priority of precedent activities. For the purpose of determining the daily volume of traffic, construction time is estimated to take approximately two years, with construction occurring only during the spring, summer and fall (see Appendix H).

Based on the information above, inbound and outbound Project-generated vehicle trips were calculated for the a.m. and p.m. peak hours. Those numbers are shown below in **Table 3.14-3**.

TABLE 3.14-3
PEAK-HOUR PROJECT TRIP GENERATION – PROJECT CONSTRUCTION

Location	A.M. Peak Hour		P.M. Peak Hour	
	Inbound	Outbound	Inbound	Outbound
SR 299 to/from the west				
Pick-up Trucks	104	0	0	104
Heavy Trucks	156	0	0	156
SR 299 to/from the east				
Pick-up Trucks	69	0	0	69
Heavy Trucks	112	0	0	112
Total				
Pick-up Trucks	173	0	0	173
Heavy Trucks	441	0	0	441

SOURCES: Appendix H and EIR Preparers.

Operation Trip Generation and Distribution

After construction of the Project, operations and maintenance traffic would be limited to a few passenger vehicle trips per day. Up to 12 full-time employees would be required for on-site operations of the Project. Many activities would be conducted remotely and on-site personnel would access the site for routine and unscheduled maintenance and repair activities. Therefore, it was conservatively assumed a total of 12 operations and maintenance workers daily would arrive at the Project Site during the a.m. peak hour, and 12 would leave during the p.m. peak hour, traveling both westbound and eastbound on SR 299 depending on the employee's point of origin.

Based on the information above, inbound and outbound Project-generated vehicle trips were calculated for the a.m. and p.m. peak hours. Those numbers are shown below in **Table 3.14-4**.

TABLE 3.14-4
PEAK-HOUR PROJECT TRIP GENERATION – PROJECT OPERATION

Location	A.M. Peak Hour		P.M. Peak Hour	
	Inbound	Outbound	Inbound	Outbound
SR 299 to/from the west				
Pick-up Trucks	8	0	0	8
Heavy Trucks	0	0	0	0
SR 299 to/from the east				
Pick-up Trucks	4	0	0	4
Heavy Trucks	0	0	0	0
Total				
Pick-up Trucks	12	0	0	12
Heavy Trucks	0	0	0	0

SOURCES: Appendix H and EIR Preparers.

3.14.3.2 Direct and Indirect Effects of the Project

a) Whether the Project would conflict with a program plan, ordinance or policy addressing the circulation system, including transit, roadway, bicycle and pedestrian facilities.

Impact 3.14-1: The Project could conflict with a program plan, ordinance or policy addressing the circulation system. (*Less-than-Significant Impact*)

Site Clearing and Construction

Highway Level of Service

Temporary increases in traffic due to Project construction have the potential to cause operating conditions (i.e., LOS) to deteriorate on SR 299. **Table 3.14-5** provides the LOS analysis results for the nine study roadway segments of SR 299 for Project construction conditions. As shown in the table, all study roadway segments would continue to operate at an acceptable LOS according to Caltrans' standard (LOS C or better) with the addition of Project construction traffic. As such, the

temporary impact of Project construction on SR 299 would be less than significant. Additional detail is provided in Appendix H.

TABLE 3.14-5
SR 299 PEAK-HOUR LEVEL OF SERVICE – PROJECT CONSTRUCTION

Location	Hourly Capacity	Existing Peak-Hour Volume	Project Construction Peak-Hour Volume	V/C	LOS C or better?
I-5 Junction (Redding)	9,200	2,150	2,670	0.29	Yes
Between I-5 and Hawley Road	9,200	1,150	1,670	0.18	Yes
Between Hawley Road and Old Oregon Trail	9,200	940	1,460	0.16	Yes
Between Old Oregon Trail and Deschutes Road	4,000	490	1,010	0.25	Yes
Between Deschutes Road and Terry Mill Road	4,000	360	880	0.22	Yes
Between Terry Mill Road and Big Bend Road	4,000	320	840	0.21	Yes
Between Big Bend Road and Tamarack Road[a]	4,000	320	840 (W) 682 (E)	0.21 (W) 0.17 (E)	Yes
Between Tamarack Road and Elm Street	4,000	370	732	0.18	Yes
Between Elm Street and Plumas Street (Burney)	4,000	880	1,242	0.31	Yes

NOTE:
[a] Two volumes and v/c are provided for this segment because the Project Site lies within it; Project construction trips would be different depending on whether they are traveling to/from the west or the east of the Project Site.

SOURCES: Transportation Research Board, 2000; Caltrans, 2017; EIR Preparers.

Intersection Level of Service

Temporary increases in traffic due to Project Site preparation (including timber harvesting) and construction have the potential to cause operating conditions (i.e., LOS) to deteriorate on SR 299 where the three Project driveways would provide access to and from the Project Site. **Table 3.14-6** provides the LOS analysis results for the three Project driveways Project construction conditions. As shown in the table, all study roadway segments would continue to operate at an acceptable LOS according to Caltrans' and Shasta County standards (LOS C or better) with the addition of Project construction traffic. As such, the temporary impact of Project construction on operations where the three proposed Project driveways intersect with SR 299 would be less than significant. Additional detail is provided in Appendix H.

TABLE 3.14-6
PEAK-HOUR PROJECT TRIP GENERATION – PROJECT OPERATION

Intersection	A.M. Peak Hour		P.M. Peak Hour	
	Delay (seconds)	LOS	Delay (seconds)	LOS
West Access and SR 299	4.8	A	2.2	A
North Access and SR 299	3.8	A	2.6	A
East Access and SR 299	7.2	A	4.4	A

SOURCES: Appendix H and EIR Preparers.

Transit, Bicycle, and Pedestrian Facilities

As described above in Section 3.14.1.2, *Environmental Setting*, there are no existing or planned bicycle or pedestrian facilities on SR 299 adjacent to the Project Site. Transit service is limited to one bus route that makes only three roundtrip runs per day SR 299 between Redding and Burney, with no bus stops adjacent to the Project Site. Due to the limited provision of alternative transportation facilities, the Project would not result in any conflicts with adopted policies, plans, or programs supporting alternative transportation. Therefore, the impact would be less than significant.

Operation and Maintenance

As shown in Table 3.14-3, the Project's operation and maintenance phase would generate considerably less traffic than the construction phase. Therefore, consistent with the determination for Project construction, the impact on operations where the three proposed Project driveways intersect with SR 299 and on the SR 299 roadway segments would be less than significant for Project operation and maintenance.

Decommissioning and Site Reclamation

Decommissioning and site reclamation impacts would be relatively similar to those identified for construction of the Project, except considerably less intensive in that no concrete batch plant(s), cable delivery, or concrete trucks would be required, and no cable trenching or similar work would occur. Moreover, existing service roads would be used; no new access roads or road widening would be required. As a result, the total number of all trips associated with decommissioning and site restoration would be less than the 93,088 trips estimated for Project construction. Thus, decommissioning of the Project would result in a less-than-significant impact with respect to LOS for roadways.

Mitigation: None required.

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b) Whether the Project would conflict or be inconsistent with CEQA Guidelines §15064.3(b).

Impact 3.14-2: The Project could conflict or be inconsistent with CEQA Guidelines Section 15064.3(b). (*Less-than-Significant Impact*)

As noted above, the California Natural Resources Agency revised CEQA Guidelines Section 15064.3(b) in December 2018 to shift the focus of transportation analyses from driver delay to reduction of GHG emissions based on an evaluation of vehicle miles traveled, or VMT. VMT is a measure of the total number of miles driven to or from a development and is sometimes expressed as an average per trip or per person. The VMT analysis prepared for the Project estimated the total VMT during the two-year construction period to be approximately 4,336,990; VMT during the two-year decommissioning period would be comparable. VMT generated during Project operation would be much less than that generated during Project construction and decommissioning. It was assumed 12 trucks per day would be utilized for operations and maintenance of the proposed project, and that each truck would travel approximately 50 miles per

day from their place of origin to the Project Site for inspection, maintenance and operation, and then travel approximately 50 miles for the return trip. Therefore, the total VMT per day during Project operation is assumed to be 600 for trucks. Per capita daily VMT for the permanent employees at the facility is estimated to be approximately 50. Additional detail on VMT assumptions and calculations for all vehicle and trip types is provided in Exhibit 3 of Appendix H.

As explained in Section 3.14.2, *Significance Criteria*, the County has not adopted VMT significance thresholds and, accordingly, has decided to rely on an established environmental standard that is protective of resources of legislative concern in mandating that lead agencies evaluate VMT, i.e., a GHG emissions threshold. The intent of SB 743 is to encourage land use and transportation planning decisions and investments to reduce VMT and thereby contribute to the reduction of GHG emissions, as required by Assembly Bill 32. Therefore, for purposes of this Project, the Project's impact to VMT would be significant if it would conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of GHGs. The evaluation of Impact 3.10-2 in Section 3.10, *GHG Emissions*, concludes that the Project would result in a less-than-significant impact related to a potential conflict with an applicable plan, policy or regulation adopted for the purpose of reducing GHG emissions, and so too would result in a less-than-significant transportation impact relating to VMTs.

Mitigation: None required.

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c) Whether the Project would substantially increase hazards due to a geometric design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment).

Impact 3.14-3: The Project would, unless mitigated, substantially increase safety hazards. (*Less than Significant with Mitigation Incorporated*)

The Project would not include a design feature or utilize vehicles with incompatible uses that would create a hazard on the roadways surrounding the Project Site. However, the Project could, unless mitigated, substantially increase hazards to vehicles, bicyclists, and pedestrians traveling on SR 299 due to the proposed use of oversize/overweight vehicles. During Project construction, heavy construction equipment and wind turbine components (e.g., blades, nacelles) would be delivered to (and during decommissioning would be removed from) the Project Site using area roadways, some of which may require transport by oversize/overweight vehicles. The transport of these materials would require transportation permits from Caltrans for oversize/overweight vehicles. Heavy equipment associated with these components would not be hauled to/from the site daily, but rather would be hauled in and out on an as needed basis. The County has determined that the proposed use of oversize vehicles could create a hazard to the public by limiting motorist, bicyclist, and pedestrian views on roadways and by the obstruction of space, which is considered a potentially significant impact.

The need for and number of escorts, California Highway Patrol escorts, as well as the timing of transport, would be at the discretion of Caltrans and Shasta County, and would be detailed in

respective oversize/overweight permits. The Applicant has initiated coordination with the Caltrans' Office of Transportation Permits, and has determined that any specific weight and height limitations would only be determined once a contractor has been selected and a Route Request Permit defining the origin and destination of the equipment/components is requested. Compliance with these permitting and related requirements would reduce potential Project impacts to a less-than-significant level, because they would require the construction contractor to incorporate measures targeted at limiting unnecessary delays and providing safe access through the construction zone for all roadway users (including vehicles, bicyclists, and pedestrians). In appropriate situations, a requirement that a project comply with specific laws or regulations may serve as adequate assurance that no significant impact would result. The County has determined that this is such a situation. Mitigation Measure 3.14-3 would require that all oversize/overweight vehicles used on public roadways during construction obtain required permits and obtain approval of a Construction Traffic Control Plan, as well as identify anticipated construction delivery times, vehicle travel routes, and potential conflicts with other projects generating traffic or delay on SR 299, in advance to minimize the potential hazard to the public associated with limiting motorist, bicyclist, and pedestrian views on roadways and introducing obstructions on SR 299. This would ensure that construction-related oversize/overweight vehicles are in compliance with applicable Vehicle Code sections and Street and Highway Code sections applicable to licensing, size, weight, load, and roadway encroachment of construction vehicles.

Mitigation Measure 3.14-3: Traffic Management Plan.

Prior to the issuance of construction or building permits and prior to the removal of materials from the Project Site during decommissioning, the Applicant shall:

1. Prepare and submit a Traffic Control Plan to Shasta County Public Works Department and the Caltrans offices for District 2, as appropriate, for approval. The Traffic Control Plan must be prepared in accordance with both the Caltrans Manual on Uniform Traffic Control Devices and Work Area Traffic Control Handbook and must include, but not be limited to, the following:

    a. A plan for communicating construction/decommissioning plans with Caltrans, emergency service providers, and residents located in the vicinity of the Project Site.

    b. An access and circulation plan for use by emergency vehicles when lane closures and/or detours are in effect. If lane closures occur, provide advance notice to local fire departments and sheriff's department to ensure that alternative evacuation and emergency routes are designed to maintain response times.

    c. Timing of deliveries to/removals from the Project Site of heavy equipment and building materials;

    d. Directing vehicles, pedestrians, and bicyclists on SR 299 through the construction zone with a flag person;

    e. Providing detours to route vehicular traffic, bicyclists, and pedestrians around lane or shoulder closures, if they occur;

    f. Providing adequate parking for construction trucks, equipment, and workers in the designated staging areas within the Project Site;

g. Placing temporary signage, lighting, and traffic control devices if required, including, but not limited to, appropriate signage along access routes to indicate the presence of heavy vehicles and construction/decommissioning traffic, and the placement of traffic cones to provide temporary left-turn lanes into Project driveways as needed;[1]

h. Preserving access to existing ingress/egress points for all adjacent property at all times; and,

i. Specifying both construction/decommissioning-related vehicle travel and oversize/overweight vehicle haul routes.

2. Obtain all necessary encroachment permits for the work within the road right-of-way or use of oversized/overweight vehicles that will utilize county maintained roads, which may require California Highway Patrol or a pilot car escort. Copies of the approved traffic plan and issued permits shall be submitted to the Shasta County Public Works Department and Caltrans.

3. Consult with the Shasta County Public Works Department and Caltrans to identify any substantial construction activities on SR 299 that may overlap with construction of the Project (e.g., Caltrans SR 299 resurfacing project from Milepost 60.0 to 67.8). Coordinate with the contractor(s) of any identified project(s) to ensure that overlapping construction activities do not cause unnecessary delays on SR 299 or preclude the ability of large vehicles to access the Project Site.

Significance after Mitigation: Less than significant.

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d) Whether the Project would result in inadequate emergency access.

Impact 3.14-4: The Project would, unless mitigated, result in inadequate emergency access. (*Less than Significant with Mitigation Incorporated*)

The Project Site is located in a rural area adjacent to SR 299, with the three Project driveways allowing adequate egress/ingress to the site in the event of an emergency. Additionally, as part of the Project, additional onsite access roadways (internal to the site) would be constructed. During inclement winter months, emergency access could be provided to and through the Project Site via snowcats, ATVs, or helicopter where sufficient clearance is available. Therefore, the development of the Project would not physically interfere with emergency vehicle access or personnel evacuation from the site in these respects.

The Project would not require closures of public roads, which could inhibit access by emergency vehicles. Further, as described above, the Project's proposed use of oversized vehicles during construction and decommissioning would not cause a significant adverse impact on emergency access to or near the Project Site if oversize/overweight vehicle permits and related requirements are complied with. Because Mitigation Measure 3.14-3 includes a plan for communicating

[1] A left-turn lane warrant analysis was conducted for the three Project driveways, which is provided in Appendix H. The analysis found that left-turn lanes would be warranted during Project construction at all three Project driveways during the a.m. peak hour.

construction/decommissioning plans with emergency service providers that operate in the vicinity of the Project Site, and drivers of emergency vehicles can use sirens to clear a path of travel, emergency access would be maintained and response times would be comparable to delay experienced under baseline conditions during other traffic control scenarios that occur on the highway, such as road construction, during Project construction and decommissioning.

Mitigation Measure 3.14-4: Implement the Traffic Management Plan that would be required by Mitigation Measure 3.14-3.

Significance after Mitigation: Less than significant.

3.14.3.3 PG&E Interconnection Infrastructure

As noted in Section 2.4.3, *Project Substation, Switching Station and Interconnection Facilities*, minor modifications or upgrades to the existing 230 kV line may be required to facilitate the Project's interconnection. Upgrades to PG&E facilities are anticipated to include construction and/or reconfiguration of utility line structures and transmission line circuits involving four to six new transmission poles. If required, these new poles would be constructed adjacent to the proposed substation and switching station. These improvements would be contained within the Project Site and would, in and of themselves, result in a less-than-significant impact to Transportation conditions on publicly accessible roadways.

No mitigation would be required specific to the PG&E interconnection infrastructure. As part of the Project, construction, operation, maintenance and decommissioning of the PG&E interconnection infrastructure would result in a less-than-significant impact relating to the potential for a significant conflict with a program plan, ordinance or policy addressing the circulation system and consistency with CEQA Guidelines Section 15064.3(b). If oversized deliveries for the PG&E interconnection infrastructure are required, then deliveries will be described in the Traffic Management Plan and carried forth as described under Mitigation Measures 3.14-3.

3.14.3.4 Direct and Indirect Effects of Alternatives

Alternative 1: South of SR 299

Under Alternative 1, construction activities would generate fewer vehicle trips by pick-up trucks and haul trucks than the number estimated for the Project because up to seven fewer turbines and their related infrastructure would be constructed. Similarly, the Decommissioning and Site Reclamation phase would also generate fewer vehicle trips by pick-up trucks and haul trucks than the number estimated for the Project, as the number of turbines and their related infrastructure to be removed and size of the area to be reclaimed would be less than what was identified for the Project. Operation of Alternative 1 would likely result in the same impact as that identified for the Project because no reduction in employee trips to or from the Project Site is anticipated. In sum, the impacts of Alternative 1 on Transportation conditions would be less than or the same as the impacts identified for the Project.

Despite its overall smaller size, Alternative 1 would still substantially increase safety hazards and would, therefore, be required to implement Mitigation Measure 3.14-1.

Alternative 2: Increased Setbacks

Under Alternative 2, construction activities would generate fewer vehicle trips by pick-up trucks and haul trucks than the number estimated for the Project because four fewer turbines and their related infrastructure would be constructed. Similarly, the Decommissioning and Site Reclamation phase would also generate fewer vehicle trips by pick-up trucks and haul trucks than the number estimated for the Project, as the number of turbines and their related infrastructure to be removed and size of the area to be reclaimed would be less than what was identified for the Project. Operation of Alternative 2 would likely result in the same impact as that identified for the Project because no reduction in employee trips to or from the Project Site is anticipated. In sum, the impacts of Alternative 2 on Transportation conditions would be less than or the same as the impacts identified for the Project.

Despite its overall smaller size, Alternative 2 would still substantially increase safety hazards and would, therefore, be required to implement Mitigation Measure 3.14-1.

No Project Alternative

If the No Project Alternative is implemented, none of the proposed wind project infrastructure would be delivered to the Project site or constructed, operated and maintained, or decommissioned there. No deliveries by oversize/overweight vehicles or other vehicle types and no worker vehicle trips would be made to, from, or within the Project Site relative to baseline conditions. SR 299 and roadways between the Project Site and Redding, Burney, Fall River Mills, and McArthur would not be affected by Project vehicles. The Project Site would continue to be operated as managed forest timberlands. Because there would be no change relative to baseline conditions, the No Project Alternative would create no impact related to Transportation.

The Project Site is zoned for timber production. Pursuant to regulations implementing the California Timberland Productivity Act (Government Code §51100 et seq.; 14 Cal. Code Regs. §897[a]), there is a legal presumption that “timber harvesting is expected to and will occur on such lands.” The regulations further specify that timber harvesting on such lands “shall not be presumed to have a Significant Adverse Impact on the Environment” (14 Cal. Code Regs. §898). Therefore, the No Project Alternative, including anticipated timber harvesting, is not presumed to result in a significant adverse individual or cumulative effect related to Transportation. CAL FIRE would review any future timber harvesting proposal to evaluate any potential project-specific, site-specific environmental impacts.

3.14.4 Cumulative Analysis

The geographic area considered in this evaluation of potential cumulative effects is consistent with the study area identified in Section 3.14.1.1 with a particular focus on cumulative projects located within a 6-mile radius of the Project Site. This geographic area was selected based on the professional opinion of the EIR preparers that traffic generated by cumulative projects further than 6 miles from the Project Site would not have a noticeable effect on traffic conditions at study intersections or roadway segments. Potential cumulative effects could result as soon as a Project-related worker or materials delivery begins its trip to the Project Site, and as late as the last Project vehicle to leave during decommissioning and site reclamation. As described in Section 3.14.1, *Setting*, there is no existing significant adverse cumulative condition to which the Project could contribute.

The incremental impacts of the Project, when considered with the incremental impacts of other projects identified in Section 3.1.2.1, *Cumulative Scenario*, would occur primarily during construction and decommissioning, because the Project's operations and maintenance-related traffic would be minimal. Therefore, operation of the Project would result in a less-than-significant cumulative impact.

Potential cumulative construction or decommissioning impacts could result if multiple projects would be generating traffic or transportation demands in the same area at the same time as the Project.

As discussed in Section 3.1.2, *Cumulative Effects Approach*, the cumulative analysis considers a number of different types of cumulative projects, including timber management and harvesting, surface mining and reclamation projects, land use projects identified in either the Shasta County permit system, and other projects within Shasta County with lead agencies other than the County. Due to the rural nature of the Project Site, only one reasonably foreseeable cumulative project was identified within a 6-mile radius of the project site: a Caltrans roadway pavement project scheduled for construction in 2021 on approximately 7 miles of SR 299 between Milepost 60.0 and Milepost 67.8. This project is located along the study roadway segment of SR 299 between Big Bend Road and Tamarack Road (Milepost 60.1 to 73.1) and would occur directly adjacent to the Project Site. Although the precise dates of Project construction activities are unknown at this time, it is possible that the Caltrans pavement project could overlap with Project construction activities. Detailed construction information on the Caltrans project is unavailable at this time, but it would be reasonable to assume that this type of project would require temporary lane closures, which would necessitate the use of temporary traffic controls (e.g., flaggers, traffic cones, signage). These features, in combination with the increased construction traffic generated by the Project, could cause noticeable temporary traffic delays on SR 299, resulting in a potential significant cumulative impact. Furthermore, the Caltrans project could impede access to the Project Site for large trucks hauling materials, as the size of those vehicles may make maneuvers through temporary traffic controls difficult or impossible.

Mitigation Measure 3.14-1 includes a provision that the Applicant and their contractor would coordinate construction plans with any nearby projects with overlapping construction schedules/activities, which would include the Caltrans project described above. With

implementation of Mitigation Measure 3.14-1, the Project's cumulative impact would not be cumulatively considerable.

Mitigation Measure 3.14-3: Implement Mitigation Measure 3.14-1 (Traffic Management Plan).

Significance after Mitigation: Less than significant.

3.14.5 References

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3.15 Utilities and Service Systems

This section identifies and evaluates issues related to Utilities and Service Systems (including water supplies, wastewater treatment, and solid waste) in the context of the Project and alternatives. It includes information about the physical and regulatory setting and identifies the criteria used to evaluate the significance of potential impacts, the methods used in evaluating these impacts, and the results of the impact assessment. The County did not receive any scoping input about these considerations. See **Appendix J**, *Scoping Report*.

Section XIX of the CEQA Guidelines Appendix G environmental checklist, which addresses utilities and service systems, also identifies considerations relating to water and wastewater treatment facilities, stormwater drainage facilities, electric power and telecommunications facilities, natural gas facilities, and regulatory compliance and solid waste. Scoping input and the potential for the Project to result in impacts to these considerations is addressed in Section 3.1.4, *Environmental Considerations Unaffected by the Project or Not Present in the Project Area.*

3.15.1 Setting

3.15.1.1 Study Area

For the purposes of this analysis, the study area is defined as all relevant utility or service systems (water supply, wastewater, stormwater, solid waste disposal, gas and electrical, and telecommunication utilities) that provide service to the Project Site.

3.15.1.2 Environmental Setting

Water Supply

The Project Site is not currently served by water supply infrastructure. Most water supply in Shasta County comes from surface flows that are subject to existing water rights (Shasta County, 2004). The closest public water supply provider to the Project Site is the Burney Water District, a municipal provider that sources water from deep groundwater wells (Burney Water District, 2020). Groundwater supplies underlying the Project Site are not well defined; however, new onsite well(s) may be used to access local groundwater as the Project's water supply. For more information regarding surface water and groundwater resources, please see Section 3.12, *Hydrology and Water Quality*, and the Project-specific water supply assessment prepared by the Applicant that is provided in **Appendix I**, *Water Supply Assessment*. The County independently reviewed this and other materials prepared by or on behalf of the Applicant and determined them to be suitable for reliance (in combination with other materials included in the formal record) in the preparation of this Draft EIR.

Wastewater Service

Wastewater treatment in Shasta County typically is achieved through on-site disposal systems or community wastewater disposal (Shasta County, 2004). The Project Site is not currently served by wastewater infrastructure; wastewater from the operations and maintenance (O&M) facility

would be processed using an on-site septic system. The closest public wastewater treatment provider to the Project Site is the Burney Water District.

Stormwater Service

Existing stormwater infrastructure at the Project Site predominantly consists of standard culverts that discharge stormwater runoff to intermittent streams along existing access roads throughout the study area. See Section 3.12, *Hydrology and Water Quality*, for more information on stormwater and drainage in the area.

Solid Waste Disposal

Shasta County currently has three landfills in operation: West Central Landfill, Anderson Landfill, and Twin Bridges Monofill. Solid waste and debris produced from the Project during construction would be sent to the Burney Transfer Station, approximately 18 miles northeast of the Project Site, and ultimately would be disposed of or recycled at the Anderson Landfill. The Anderson Landfill is approximately 76 miles away from the Project Site and has a remaining capacity of 10,409,132 cubic yards and a maximum capacity of 16,353,000 cubic yards (CalRecycle, 2019). The Anderson Landfill is permitted to accept construction and demolition waste, in addition to agricultural, industrial, mixed municipal, sludge, biosolids, tires, and wood waste (CalRecycle, 2019).

Energy Service

Pacific Gas & Electric Company (PG&E) provides electricity and natural gas service to Shasta County and would provide electricity to the Project Site. The Project would connect to existing PG&E infrastructure in addition to an existing 230 kV transmission line, which would be located directly adjacent to the proposed switching station. See Figure 2-2, *Site Plan*, for more details. See Section 3.7, *Energy*, for more information on PG&E infrastructure.

Telecommunication Utilities

There are two cellular telecommunications towers located near the Project Site. The International Communications Group, Inc., cell tower is located south of the Project Site and the Hatchet Mountain cell tower, which is owned by the State of California, is located north east of the Project Site. Both are located in unincorporated Shasta County (Cell Reception, 2020).

3.15.1.3 Regulatory Setting

Federal

No federal regulations governing utilities and service systems apply to the Project.

State

California Public Utilities Commission

The California Public Utilities Commission (CPUC) regulates services and utilities and assures California's access to safe and reliable utility infrastructure and services. The essential services

regulated include, electric, natural gas, telecommunications, water, railroad, rail transit, and passenger transportation companies. The CPUC implements CEQA for utility construction by PG&E and the other public utilities under its jurisdiction, and regulates the location and relocation of power lines by investor-owned utilities, such as PG&E.

Z'Berg-Nejedly Forest Practice Act of 1973

The Z'Berg-Nejedly Forest Practice Act of 1973 (Pub. Res. Code §§4511–4360.2) and its implementing regulations, the Forest Practice Rules (14 Cal. Code Regs. §895 et seq.), govern the management of privately-owned forestlands in California, including regarding the disposal of related refuse, litter, trash and debris. See Rule 934.5, which establishes the following performance standard in connection with waste disposal: "Non-biodegradable refuse, litter, trash, and debris resulting from timber operations, and other activity in connection with the operations shall be disposed of concurrently with the conduct of timber operations" (14 Cal. Code Regs. §934.5).

Porter-Cologne Water Quality Control Act

The State of California's Porter-Cologne Water Quality Control Act (Water Code §13000 et seq.) grants authority over water quality regulation to the State Water Resources Control Board (SWRCB) and the nine Regional Water Quality Control Boards (RWQCBs). The Central Valley RWQCB serves the Project Site. The Central Valley RWQCB prepares and updates the Water Quality Control Plan (Basin Plan) for the Central Valley, which covers about 60,000 square miles or nearly 40 percent of the State. Additionally, the Central Valley RWQCB issues National Pollutant Discharge Elimination System (NPDES) permits and Waste Discharge Requirements in accordance with the Clean Water Act NDPES program. See Section 3.12, *Hydrology and Water Quality*, which describes the Porter-Cologne Water Quality Control Act in more detail.

Sustainable Groundwater Management Act

On September 16, 2014, Governor Jerry Brown signed into law a three-bill legislative package, composed of Assembly Bill (AB) 1739 (Dickinson), Senate Bill (SB) 1168 (Pavley), and SB 1319 (Pavley), collectively known as the Sustainable Groundwater Management Act (SGMA). SGMA requires governments and water agencies of "high" and "medium" priority basins to halt overdraft and bring groundwater basins into balanced levels of pumping and recharge. As described in Section 3.12, *Hydrology and Water Quality*, the closest defined groundwater basins to the Project Site are Burney Valley Groundwater Basin and Dry Burney Valley Basin beyond the ridge to the east of the Project Site: Neither is a "high" or "medium" priority basin, or a basin in a condition of critical overdraft.

NPDES Construction General Permit

Construction activities disturbing 1 acre or more of land, as proposed for the Project Site, are subject to the permitting requirements of the NPDES General Permit for Discharges of Storm Water Runoff Associated with Construction Activity (Construction General Permit) and must apply for Construction General Permit coverage. For all new projects, applicants must electronically file permit registration documents using the Stormwater Multiple Applications and Report Tracking Systems (SMARTS), and must include a Notice of Intent (NOI), risk assessment, site map, and stormwater pollution prevention plan (SWPPP) to be covered by the

General Construction Permit prior to beginning construction. The risk assessment and SWPPP must be prepared by a State-Qualified SWPPP Developer (QSD). See Section 3.12, *Hydrology and Water Quality*, for more detailed discussion relative to water quality.

California Integrated Waste Management Act

The Integrated Waste Management Act of 1989 (Pub. Res. Code §40050 et seq.), as amended, required each local agency to divert 50 percent of all solid waste generated within the local agency's jurisdiction by January 1, 2000. This diversion requirement remains relevant as the basis for subsequent requirements summarized below. This law requires local agencies to maximize the use of all feasible source reduction, recycling, and composting options before using transformation (incineration of solid waste to produce heat or electricity) or land disposal. The Act also resulted in the creation of the State agency now known as CalRecycle.

Under the Integrated Waste Management Act, local governments develop and implement integrated waste management programs consisting of several types of plans and policies, including local construction and demolition ordinances described in more detail below. The Act also set into place a comprehensive statewide system of permitting, inspections, and maintenance for solid waste facilities, and authorized local jurisdictions to impose fees based on the types and amounts of waste generated.

AB 341

AB 341 (Chesbro, 2011), declares that it is the policy goal of the State that not less than 75 percent of solid waste generated be source reduced, recycled, or composted by the year 2020, and annually thereafter. However, it does not permit CalRecycle to establish or enforce a diversion rate on a city or county that is greater than the 50 percent diversion rate established in the Integrated Waste Management Act.

Title 22 California Code of Regulations Division 4.5

Title 22 of the California Code of Regulations, Division 4.5, discusses an array of requirements with respect to the disposal and recycling of hazardous and universal wastes. Specific standards and requirements are included for the identification, collection, transport, disposal, and recycling of hazardous wastes. Additional standards are included for the collection, transport, disposal, and recycling of universal wastes, identified in Section 66273.9 of Title 22 of the California Code of Regulations. Requirements include recycling, recovery, returning spent items to the manufacturer, or disposal at an appropriately permitted facility. Division 4.5 of Title 22 also provides restrictions and standards relevant to waste destination facilities, and provides authorization requirements for various waste handlers.

Title 22 also regulates the treatment and use of recycled water. It lists 40 specific allowed uses of disinfected tertiary recycled water (such as irrigating parks), 24 specific allowed uses of disinfected secondary recycled water (such as irrigating animal feed and other unprocessed crops), and seven specific allowed uses of undisinfected secondary recycled water (such as industrial uses). Certain Project-related construction activities that could utilize recycled water include dust suppression, batch concrete, emergency fire suppression, washing, and other activities.

2016 California Green Building Standards Code

As amended, California's Green Building Standards Code (CALGreen; 24 Cal. Code Regs., Part 11) requires that nonresidential building projects recycle and/or salvage for reuse a minimum of 65 percent of the nonhazardous construction and demolition waste, or meet a local construction and demolition waste management ordinance, whichever is more stringent (24 Cal. Code Regs. §5.408.1). Additionally, 100 percent of trees, stumps, rocks, and associated vegetation and soils resulting primarily from land clearing must be reused or recycled unless contaminated by disease or pest infestation (24 Cal. Code Regs. §5.408.3).

The 2016 version of the code increased the minimum diversion requirement for nonhazardous construction and demolition waste to 65 percent from 50 percent (in the 2013 and earlier versions) in response to AB 341. Therefore, some local ordinances still list minimums that are less stringent than (and therefore overridden by) the statewide requirement.

California Water Code Section 10910

Water Code Section 10910 discusses water supply planning to support existing and planned future uses. It states that any project "subject to the California Environmental Quality Act pursuant to Section 21080.1 of the Public Resources Codes, shall identify any water system that is, or may become as a result of supplying water to the project identified pursuant to this subdivision, a public water system, as defined in Section 10912, that may supply water for the project. If the city or county is not able to identify any public water system that may supply water for the project, the city or county shall prepare the water assessment required by this part after consulting with any entity serving domestic water supplies whose service area includes the project site, the local agency formation commission, and any public water system adjacent to the project site."

Local

Shasta County General Plan

The Public Facilities and Water Resources and Water Quality elements of the Shasta County General Plan (2004) contain information regarding landfill facilities, solid waste disposal, water supply, and wastewater treatment for Shasta County. The Public Facilities element does not contain objectives or policies that would be applicable to the Project or inform the analysis of potential impacts of the Project. The following objectives and policies from the Water Resources and Water Quality element would apply:

Objectives:

***W-9*:** Institute effective measures to protect groundwater quality from potential adverse effects of increased pumping or potential sources of contamination.

Policies:

***W-a*:** Sedimentation and erosion from proposed developments shall be minimized through grading and hillside development ordinances and other similar safeguards as adopted and implemented by the County.

***W-c*:** All proposed land divisions and developments in Shasta County shall have an adequate water supply of a quantity and a quality for the planned uses. Project proponents

shall submit sufficient data and reports, when requested, which demonstrate that potential adverse impacts on the existing water users will not be significant. The reports for land divisions shall be submitted to the County for review and acceptance prior to a completeness determination of a tentative map. This policy will not apply to developments in special districts which have committed and documented, in writing, the ability to provide the needed water supply.

Shasta County Department of Resource Management Environmental Health Division

The Shasta County Environmental Health Division (EHD) provides permits and inspections designed to protect public health and the environment in Shasta County. The water well program was developed to protect the health, safety, and general welfare of the public and the environment, by ensuring that groundwater used by the County will not be polluted or contaminated. Well permits are required for construction, destruction (abandonment), deepening, and repairs of all wells in the County. Work resulting in drilling may only be performed by a C-57 licensed driller/contractor.

In August 2019, EHD implemented the revised Local Agency Management Program (LAMP) for onsite wastewater Treatment Systems (OWTS), which requires a permit for the installation of a new or replacement septic tank and leach field. A permit application must be submitted along with a complete site plan, fees, and soil test data. The EHD is also the Local Enforcement Agency (LEA) for all solid waste matters in Shasta County.

3.15.2 Significance Criteria

CEQA Guidelines Appendix G Section XIX identifies considerations relating to utilities and service systems. See Section 3.1.4, *Environmental Considerations Unaffected by the Project or Not Present in the Project Area*, as it relates to the County's analysis of the potential impacts of this Project to the considerations suggested in CEQA Guidelines Appendix G Section XIX. Otherwise, for purposes of this analysis, a project would result in a significant impact to Utilities and Service Systems if it would:

a) Not have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years;

b) Result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments; or

c) Generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals.

3.15.3 Direct and Indirect Effects

3.15.3.1 Methodology

The analysis of direct and indirect impacts on utilities and service systems is based on a review of the Shasta County General Plan guidelines, goals, and policies, as well as other applicable federal, state, and local regulations. The evaluation of impacts was based upon the likelihood of

the Project to increase demand, alter, or interfere with existing utilities and service systems, and/or result in the construction of additional utilities and service systems.

3.15.3.2 Direct and Indirect Effects of the Project

a) Whether the Project would have sufficient water supplies available to serve the project and reasonably foreseeable future development during normal, dry and multiple dry years.

Impact 3.15-1: The Project would have sufficient water supplies available to serve the Project for the reasonable and foreseeable future development during normal, dry, and multiple dry years. (*Less-than-Significant Impact*)

The Project would require up to 49 acre-feet of water for site clearing and construction and 5.6 acre-feet of water per year for O&M. For purposes of comparison, an average California household uses between 0.5 acre-foot and 1 acre-foot of water per year for indoor and outdoor use (Water Education Foundation, 2020). Decommissioning requirements are assumed to be comparable to construction requirements.

During construction, operation and maintenance, and decommissioning, water would be purchased from the Burney Water District and trucked onsite. The Burney Water District operates a public water system and sewer system in the unincorporated town of Burney. Burney Water District is an independent special district formed as a county water district under California Water Code Section 30000 et seq. and serves a population of 3,154 from 1,267 service connections (Appendix I).

Although groundwater supplies in this area are not well understood, the Shasta County General Plan reports that "Shasta County has not experienced a level of growth and development resulting in groundwater overdrafting" (Shasta County, 2004). The Sierra Pacific Mill, located near Burney but outside of the Burney Water District service area, withdraws 500,000 gallons per day (1.5 acre-feet per day) from onsite wells within the Burney Creek Valley Groundwater Basin, which the district also uses (Shasta County, 2004, Table W-4; DWR, 2004, 2020a). The Burney Creek Valley Groundwater Basin, Goose Valley Basin, and Dry Burney Creek Valley Basin are the closest DWR 118-desginated groundwater basins to the Project Site. Each is listed as "Very Low Priority" on the SGMA Basin Prioritization Dashboard (DWR, 2020b; Appendix I).

The current production capacity of the three Burney Water District wells is 4,600 gallons per minute (gpm), or 7,420 acre-feet per year (afy), if operated continuously. Because the Project would only temporary require 49 acre-feet of water for construction and would require only up to 5.6 afy for the operation and maintenance period, the estimated annual demand for the Project represents a negligible use compared with existing production capacity.

The Project would not result in additional reasonably foreseeable future development in the area, as it would provide electricity to the regional grid and would not indirectly induce local population growth.

Because the Project is proposed in a rural setting and would not be served by a public water system, a Water Supply Assessment has been prepared for the Project in accordance with Water Code Section 10910 (c)(4). See Appendix I, Water Supply Assessment, for details regarding the definition of a public water system. As described in detail above and further discussed in the Water Supply Assessment, it is expected that the Burney Water District would have sufficient supplies available to serve the lifespan of the Project even in dry and multiple dry years. Therefore, the impact would be less than significant.

Mitigation: None required.

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b) Whether the Project would result in a determination by the wastewater treatment provider which serves or may serve the project that it has inadequate capacity to serve the project's projected demand in addition to the provider's existing commitments.

Impact 3.15-2: The Project could result in a determination by a wastewater treatment provider that it has inadequate capacity to serve the Project's projected demand in addition to the provider's existing commitments. (*Less-than-Significant Impact)*

As described above, the majority of water used during construction and decommissioning would be for activities related to fire protection and dust suppression, and would not require treatment as wastewater because this water would be applied to the ground (or to facilities, and later run off to the ground) and most would infiltrate or evaporate. Additional runoff generated by other construction activities or increases in impervious surfaces would be managed and controlled by the SWPPP. During construction, portable toilets would be used by construction workers and would be treated on a regular basis by a licensed contractor with capacity to dispose of sanitary wastewater pursuant to applicable regulations.

Wastewater would also be processed during maintenance and operation from the O&M facility, which would use an onsite septic system. The onsite septic system would be installed in accordance with the rules and regulations of the Shasta County Department of Resource Management's Environmental Health Division. A permit would be required prior to the installation of a new or replacement septic tank and leach field. The Applicant would apply for an Onsite Wastewater Treatment System Permit with the Environmental Health Division and provide a completed site plan, fee, and soil test data.

Because it would be regulated by an Onsite Wastewater Treatment System permit, the Project would not result in a significant reduction on wastewater treatment capacity within Shasta County. Therefore, the Project would not result in a determination by a wastewater treatment provider that it has inadequate capacity to serve the Project's projected demand in addition to its existing commitments; therefore, a less-than-significant impact would occur.

Mitigation: None required.

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c) Whether the Project would generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals.

Impact 3.15-3: The Project could generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals. (*Less-than-Significant Impact)*

During site preparation and construction, approximately 10,000 pounds (5 tons) of solid waste would be generated per week, consisting of construction debris such as scrap wood and metal. The Anderson Landfill has a permitted throughput of 1,850 tons per day (CalRecycle, 2019), and the Project's contribution of approximately 1 ton per day would be a negligible increment during the construction period.

Regarding total permitted capacity of the landfill, this weight estimate is converted to cubic yards by assuming that half of the total weight is scrap metal at 1,000 pounds per cubic yard and the remaining half scrap lumber at 300 pounds per cubic yard (WasteCap Resource Solutions Inc., 2011). Based on these values, the estimated volume of solid waste generated during construction would be 22 cubic yards per week or up to approximately 2,112 cy for a duration of 24 months. During operation, solid waste generation would be significantly less than 1 cubic yard per week, consisting mainly of office trash and paper waste.

All solid waste would be collected by the contractor during construction or by Burney Waste Disposal Inc. during operation. Waste would be transported to the Burney Transfer Station and ultimately recycled or disposed of at the Anderson Landfill in accordance with federal, state, and local solid waste regulations. Decommissioning would generate the same amount of solid waste as construction (approximately 22 cubic yards per week or up to 2,112 cy for a duration of 24 months).

Prior to operation of the Project, the Applicant would prepare a Draft Decommissioning Plan that details a restoration plan and how Project facilities and infrastructure would be removed. The Draft Decommissioning Plan would include plans and procedures for facility dismantling and removal, including disposal and recycling, and would be developed in compliance with standards and requirements at the time of site decommissioning. The Anderson Landfill has an estimated ceased operation date of 2093 with a maximum permitted throughput of 1,850 tons/day, and a remaining capacity of approximately 10,409,132 cubic yards, as of 2015 (the most recent date for which published data was available as of June 24, 2020). The Project would not generate solid waste or debris in an amount that would exceed the capacity of local infrastructure, or impair the attainment of solid waste reduction goals.

Consistent with the requirements of the Z'Berg-Nejedly Forest Practice Act of 1973, all non-biodegradable refuse, litter, trash, and debris resulting from timber harvesting operations would be disposed of concurrently with the conduct of timber operations. In addition, biodegradable waste, consisting of 100 percent of trees, stumps, rocks, and associated vegetation and soils resulting from land clearing would be reused and/or recycled unless contaminated with disease or pest infestation, consistent with the California Green Building Standards Code. In compliance with the California Green Building Standards Code and AB 341, approximately 65 percent of all

nonhazardous construction and demolition waste would be recycled or salvaged for reuse at an appropriate facility. Therefore, the Project would not impair the attainment of these solid waste reduction goals, and the impact would be less than significant.

Mitigation: None required.

3.15.3.3 PG&E Interconnection Infrastructure

The Project would tap into the existing PG&E 230 kV line via an aboveground line tap located directly adjacent to the switching station. Minor modifications or upgrades to the existing 230 kV line may be required to facilitate the Project's interconnection. Upgrades to PG&E facilities are anticipated to include construction and/or reconfiguration of utility line structures and transmission line circuits involving four to six new transmission poles. If required, these new poles are anticipated to occur adjacent to the proposed substation and switching station. The Applicant would construct the switching station and PG&E would construct the electrical connections to its facility. PG&E ultimately would own and operate the switching station and interconnection components.

Although these modifications would result in alterations of an existing electrical facility, the Project would not disrupt service or result in alteration due to an increase in need or lack of capacity. The PG&E interconnection infrastructure for the Project would not result in the need for new or relocated utilities or service systems, would not generate its own water demand that could result in insufficient supplies, and would not result in substantial solid waste generation. The amount of water required and waste generated during construction of these facilities is included in the totals for the Project as a whole and, for the reasons explained in Section 3.15.3.2, *Direct and Indirect Effects of the Project*, impacts would be less than significant.

3.15.3.4 Direct and Indirect Effects of Alternatives

Alternative 1: South of SR 299

Alternative 1 would consist only of Project components located south of SR 299. This would include approximately 4,086 acres located south of SR 299, and exclude approximately 378 acres, including seven turbines and associated infrastructure, located north of SR 299. For the purposes of this analysis, it can be assumed that water, wastewater, and hazardous materials–related requirements would be slightly reduced relative to the Project; and that the number of workers and durations of construction, O&M, and decommissioning and site restoration would be substantially the same as for the Project. Impacts related to water and wastewater services would be the same as the Project (less than significant).

It also can be reasonably assumed that solid waste generated during construction and decommissioning would be incrementally less than the Project because there would be less to construct, and therefore, less to remove. The Anderson Landfill would still maintain capacity during construction, O&M, and decommissioning of Alternative 1. Stormwater drainage would

not be required north of SR 299 and Alternative 1 would not result in a need for additional stormwater drainage facilities to serve the Alternative further from what is proposed in the Project. The impact and ground disturbance related to the overhead and underground collector system, access roads, and laydown areas also would be reduced and the impact would remain less than significant.

Alternative 2: Increased Setbacks

Alternative 2 would exclude construction of proposed turbines M03, D05, B01, and K02 based on the setbacks mentioned in Section 2.5.3.3, *Alternative 2: Increased Setbacks*. These setbacks would result in no temporary turbine construction areas, access roads, and/or crane roads for these four turbine work areas. It reasonably can be assumed that the water, wastewater, and hazardous materials would be slightly less than the Project. Stormwater drainage in the form of culverts and ditches along access roads would be reduced, but would not result in the need for additional stormwater drainage facilities. The impact and ground disturbance related to the overhead and underground collector system, access roads, and laydown areas also would be reduced and the impact would remain less than significant for utilities and service systems under Alternative 2.

No Project Alternative

If the No Project Alternative is implemented, none of the proposed wind project infrastructure would be delivered to the Project site or constructed, operated and maintained, or decommissioned there. No groundwater well, water storage tank, or septic system would be installed onsite, no construction-related or other refuse would be removed from the site. No electric power would be needed at the Project Site, or delivered to the regional grid from the Project Site. Ground clearance would not occur for laydown areas; utility line rights-of-way; or the collector substation, switching station, or O&M facility. No new roads would be constructed within the Project Site, and none of the existing roads would be improved. Existing stormwater drainage patterns on the site would not be affected. The Project Site would continue to be operated as managed forest timberlands. Because there would be no change relative to baseline conditions, the No Project Alternative would create no impact related to Utilities and Service Systems.

The Project Site is zoned for timber production. Pursuant to regulations implementing the California Timberland Productivity Act (Government Code §51100 et seq.; 14 Cal. Code Regs. §897[a]), there is a legal presumption that “timber harvesting is expected to and will occur on such lands.” The regulations further specify that timber harvesting on such lands “shall not be presumed to have a Significant Adverse Impact on the Environment” (14 Cal. Code Regs. §898). Therefore, the No Project Alternative, including anticipated timber harvesting, is not presumed to result in a significant adverse individual or cumulative effect related to Utilities or Service Systems. CAL FIRE would review any future timber harvesting proposal to evaluate any potential project-specific, site-specific environmental impacts.

3.15.4 Cumulative Analysis

The geographic scope of cumulative impact analysis for utilities and service systems includes the service areas of each of the relevant utility or service systems including water supply, wastewater, stormwater, solid waste disposal, electrical, and telecommunication utilities that provide service to the Project site and/or could be affected by the Project. This geographic extent is appropriate because increases in demand are generally limited to the service area of the utility purveyor or service provider. The majority of the less-than-significant impacts on utilities and service systems would result from temporary construction lasting 18 to 24 months. None would require mitigation or be significant and unavoidable. The following impacts are all determined to be less than significant and are discussed cumulatively below.

As discussed above in the context of Impact 3.15-1, the Project would use groundwater sourced from onsite wells or an off-site provider likely to be Burney Water District, which draws water from the Burney Creek Valley Groundwater Basin. None of the groundwater basins in the Burney area are in an overdraft condition. The effects of the existing Hatchet Ridge Wind Project and other industrial groundwater users such as the Sierra Pacific Mill in Burney are accounted for in the baseline conditions (i.e., no overdraft). None of the other reasonably foreseeable projects described in Section 3.1.2.1, *Cumulative Scenario*, would be located within the same groundwater basins that may be used for Project water sources; therefore, no significant cumulative impact would occur. (Less than Significant)

As discussed above in the context of Impact 3.15-2, the majority of workers during construction would be local, so the Project would not cause a population increase that could increase demand for wastewater treatment capacity. Direct Project wastewater treatment needs would be served by a licensed contractor with capacity to dispose of sanitary wastewater pursuant to Shasta County EHD regulations (during construction) and by an onsite septic system (during operation and maintenance and decommissioning). Therefore, the Project would have no contribution to potential cumulative impacts on wastewater treatment capacity. (No Impact)

As discussed above in the context of Impact 3.15-3, the Anderson Landfill has a significant amount of remaining capacity to serve the Project (over 10 million cubic yards out of a total maximum capacity of 16 million cubic yards). The Project would generate approximately 22 cubic yards per week during construction and less than 1 cubic yard per week during operation, all of which either would be recycled or disposed of at the Anderson Landfill. Several of the other reasonably foreseeable projects described in Section 3.1.2.1 also could be served by Anderson Landfill. The Dignity Health North State Pavilion Project, which could be a large solid waste generator, would dispose of waste at the Richard W. Curry Sanitary Landfill, as would all projects within the City of Redding (City of Redding, 2019). No major development in the area of Shasta County in which the Project Site is located is foreseeable that would cause daily or total demand for landfill services to exceed the capacity of Anderson Landfill. Therefore, no significant cumulative impact would occur. (Less than Significant)

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3.16 Wildfire

The California Department of Forestry and Fire Protection (CAL FIRE) has assigned a "Very High Fire Hazard Severity Zone" rating throughout Shasta County (Shasta County, 2016). Round Mountain, Montgomery Creek, and Burney all are listed as communities at risk by CAL FIRE's Office of the State Fire Marshal (CAL FIRE, 2019a). This section identifies and evaluates issues related to wildfire in the context of the Project and alternatives. It includes information about the physical and regulatory setting and identifies the criteria used to evaluate the significance of potential impacts, the methods used in evaluating these impacts, and the results of the impact assessment.

The Shasta County Fire Department provided initial input and recommendations related to fire prevention for the County's environmental review process shortly after the CUP application was filed for the Project (Shasta County Fire Department, 2018). Later, in response to the issuance of notice of intention to prepare this Draft EIR, the County received scoping input noting that existing conditions are windy and the terrain is steep (up to 25 percent grade), and that there is a history of lightning strikes and fires, both natural and human-caused, in the area. Options for ingress and egress are limited. Furthermore, the existing forest, which was planted after the Fountain Fire, is mostly pine. Trees are approximately 20 to 30 feet tall and grow 3 to 4 feet apart, deer brush and manzanita grow in the understory, and years' worth of pine needles cover the forest floor. Input as to potential impacts and mitigation measures also was received.

All scoping input received, including regarding Wildfire, is provided in Section 4.1 of the Scoping Report, a copy of which is provided as **Appendix J**, *Scoping Report*.

3.16.1 Setting

3.16.1.1 Study Area

The study area comprises the Project Site and the surrounding areas that could be affected by wildland fire as a result of the Project or an alternative. Information provided in this section is based on existing publications, including CAL FIRE's Shasta-Trinity Unit (SHU) 2018 Strategic Fire Plan, the Shasta County Community Wildfire Protection Plan, and the Shasta County General Plan. The Project would be located within SHU Battalion 2, as defined in CAL FIRE's SHU 2018 Strategic Fire Plan, which describes the areas surrounding the Project Site that could be affected by wildland fire. Battalion 2 generally is located south of the Pit River arm of Shasta Lake, east of Interstate 5 (I-5) and the City of Redding, north of Whitmore Road, and west of Hatchet Mountain. During the fire season, the CAL FIRE Shasta Trinity Unit has access to 19 engines, 3 dozers, 12 hand crews, 1 air tactical plane, and 2 air tankers (CAL FIRE, 2018).

3.16.1.2 Environmental Setting

Fire History and Historical Fire Regime

Shasta County has experienced several major fires in the last 30 years. The largest and most recent fire was the Carr Fire in 2018, which burned a total of 229,651 acres; this occurred outside

of the study area and to the west of Redding (the Project Site is located east of Redding) (CAL FIRE, 2020). Within the "Timber East" area of the county, large fires have included the 1998 Burney Fire (3,264 acres), the 1992 Fountain Fire (60,290 acres), the 2012 Ponderosa Fire (27,676 acres), and the 2014 Eiler Fire (32,416 acres) (CAL FIRE, 2018). The Fountain Fire originated approximately 1.5 miles away from the Project Site at Round Mountain. As seen in this portion of Shasta County's fire history, with heavy fuel loading, hot temperatures, critically low humidity, and strong north winds, the study area has the potential to face a major wildfire threat (Shasta County, 2016).

The continued urbanization of the Shasta-Trinity Unit's wildland areas is expected to significantly increase both the ignition potential of and damage from wildfires. About 90 percent of major fires in the county have human-related ignition sources include burning of debris, equipment use, vehicle, and arson. Lightning causes the remaining 10 percent of wildfires in Shasta County (Shasta County, 2018). Periodic droughts contribute to the increase in fires due to drier than normal fuel conditions. The heavy fuel loading, hot temperatures, critically low humidity, and strong north winds characteristic of Shasta County contribute to the ongoing major wildfire potential (Shasta County, 2016).

Wildfire Behavior and Fire Hazard Mapping

Wildfire behavior is dependent on a number of biophysical (climate, topography, and vegetation) and anthropogenic (human-influenced) factors. The biophysical variables include fuels (vegetation composition, cover, and moisture content), climate (weather, wind velocity and humidity), topography (slope and aspect), and ignition sources (e.g., lightning). Anthropogenic variables consist of human activities (e.g., arson, smoking, and power lines) and management (wildfire prevention and suppression efforts). These factors are described below.

Temperature, Humidity, and Precipitation

Shasta County's climate generally is characterized by warm, dry summers and cool, wet winters. The average temperature and precipitation vary greatly within the watershed due to elevation ranges from 340 to 7,300 feet above sea level. Elevations within and near the Project Site range from approximately 3,000 to 6,600 feet (Stantec and Pacific Wind Development, LLC, 2018). The average high temperatures in July range from 80°F (at high elevations) to 99°F in the valley. The average low temperatures in December range from 21°F to 55°F. Relative humidity during the summer months is usually less than 30 percent during the day and rises to about 50 percent at night. Winter humidity usually exceeds 50 percent (Shasta County, 2016). Humidity affects the moisture level of vegetation (fuels), and low humidity levels lead to dry fuels that can ignite more easily and burn more quickly than when humidity levels are high (NPS, 2017).

Moderate to heavy amounts of snowfall are common above 3,000 feet. As described in Section 3.12, *Hydrology and Water Quality*, annual total precipitation (including rain and snow) measured at Round Mountain (3 miles west of the Project Site) is 63 inches on average (WRCC, 2020a). By contrast, the annual average precipitation measured in Burney (approximately 6 miles east of the Project Site) is just 28 inches, with annual totals of less than 11 inches in some recent drought years (WRCC, 2020b). Thus, eastern portions of the county, including some eastern

locations within the Project Site, are likely to receive considerably less precipitation due to rain shadow effects associated with the mountainous terrain, and when drought conditions are present in Shasta County, total annual precipitation can be relatively very low.

Wind

Winds are generally out of the west, southwest 5 to 12 miles per hour (mph). Occasionally light east winds occur in the morning, and winds then shift to a west/southwest direction in the afternoon and can reach speeds of 15 to 20 mph, generally up slope and up canyon. North wind events occur periodically throughout the fire season and can reach the 10 to 40 mph range with associated higher gusts. These winds frequently switch to the northeast and strengthen after dark, with occasional stronger winds reaching 50 mph in the Hillcrest/Round Mountain area between 2:00 am and sunrise (CAL FIRE and Shasta County Fire, 2018).

Topography

Topography and elevation vary greatly in the study area, which consists of several mountainous ridgelines, rugged and steep terrain, and elevations above 3,000 feet (CAL FIRE and Shasta County Fire, 2018). Within the Project Site, steep slopes are present along the North Fork of Little Cow Creek, on the south side of Lookout Mountain, along Cedar Creek, along the South Fork of Montgomery Creek, and along the North Fork of Montgomery Creek. Terrain type has a strong influence over fire behavior, and steep terrain can encourage the spread of fire when other factors such as fuels also are present. Fires can spread quickly up vegetated slopes because fuels are pre-heated by rising hot air from the active fire below (NPS, 2017).

Fuels

Fuels are made up of various components of vegetation, live and dead, that occur on a given site. Wildfire is a natural component in the evolution of vegetation of Shasta County. As described in Section 3.4, *Biological Resources*, the majority of the Project Site includes mixed conifer forests including ponderosa pine, white fir, and douglas fir. The size of these trees varies depending on whether the forest burned or was recently logged. The density of understory varies but is composed of mostly understory shrub and herbaceous vegetation that helps create ladder fuels and difficult firefighting conditions (Shasta County, 2016). Chaparral and woodland are found interspersed among the mixed conifer forest.

The SHU 2018 Strategic Fire Plan classifies the forested area east of Redding, where the study area is located, as “Timber East,” a mixed species conifer forest mostly managed for timber production. Slash (coarse and fine woody debris generated during logging operations) and brush (undergrowth) are part of the fuel component. Fire behavior fuel model 9 (Hardwood or Long Needle Pine Timber Litter) and National Fire Danger Rating System (NFDRS) fuel model U are used in this area. Fire behavior fuel model 9 is described in the following way: “Fires run through the surface litter faster than in model 8 and have longer flame lengths. Both long-needle conifer and hardwood stands are typical. Closed stands of long-needled pine like ponderosa, Jeffrey, and sugar pine and hardwood stands of oak, madrone and tanoak are grouped in this model. Concentrations of dead-down woody material will contribute to possible torching of trees, spotting, and crowning” (Anderson, 1982). Out of the Timber group fuel models, fuel model 9 is

ranked in the middle (between fuel model 8 and fuel model 10) in terms of the rate of fire spread and flame length.

Fuel model U is described as follows: "Closed stands of western long needled pines where ground fuels are primarily litter and small branchwood. Grass and shrubs are absent except in natural openings" (National Wildfire Coordinating Group, 2015). These fuel models describe typical conditions over large areas, and location-specific conditions can vary within areas assigned these models. However, overall, they accurately describe the fuel types in the study area.

At lower elevations outside of the Project Site, stands are often composed of ladder fuels, creating the potential for the initiation of crown fires.[1] Vegetation along the southwest area of Battalion 2 (i.e., closer to Redding) include grass and oak woodland up to 1,000 to 1,500 feet in elevation. Vegetation within the elevations of 1,000 to 2,000 feet consists of predominantly chaparral or dense shrubland habitat (i.e., manzanita), which typically occurs on steep hillsides and are prone to burning intensely. The chaparral brush then transitions into mixed conifer and oak in the communities of Hillcrest and Oak Run (CAL FIRE and Shasta County Fire, 2018). The mixed conifer habitat extends along steep slopes, including evergreen oaks, such as Interior live oak or Canyon live oak, and pines, such as Foothill pine or Ponderosa pine. Thus, there is some potential for fires ignited offsite to spread to the Project Site or nearby areas at similar elevations.

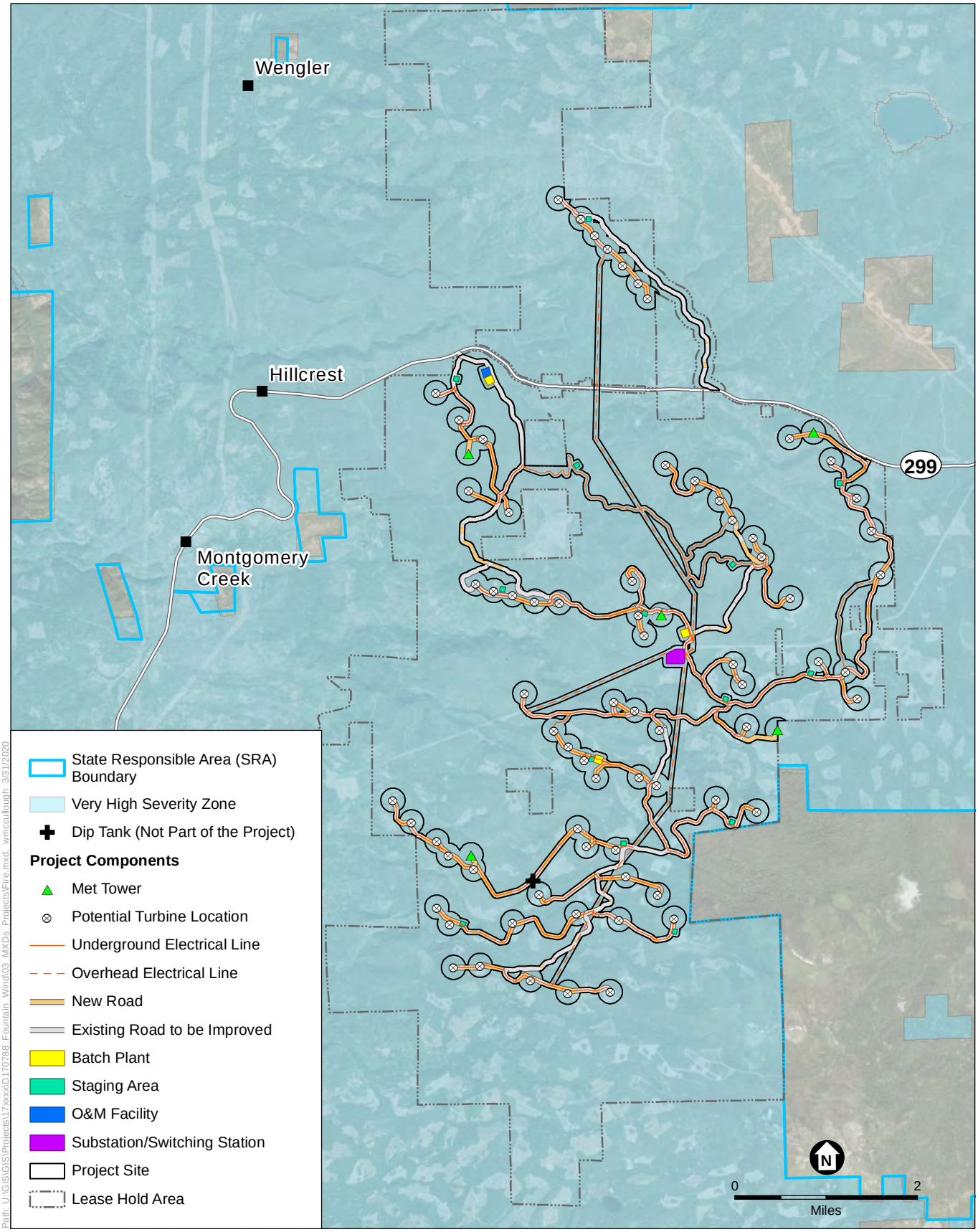
CAL FIRE Hazard Severity Zones

CAL FIRE has adopted Fire Hazard Severity Zone (FHSZ) mapping for State Responsibility Area (SRA) throughout the state. These maps rate wildfire hazards as "moderate," "high," or "very high" based on fuel loading, slope, fire weather, and other relevant factors. As shown in **Figure 3.16-1**, *CAL FIRE Fire Hazard Severity Zones*, the entire Project Site is within an SRA that is mapped as a very high FHSZ. No part of the Project Site would be located within a Local Responsibility Area (LRA).

California Public Utilities Commission–Designated Wildlife Hazard Zones

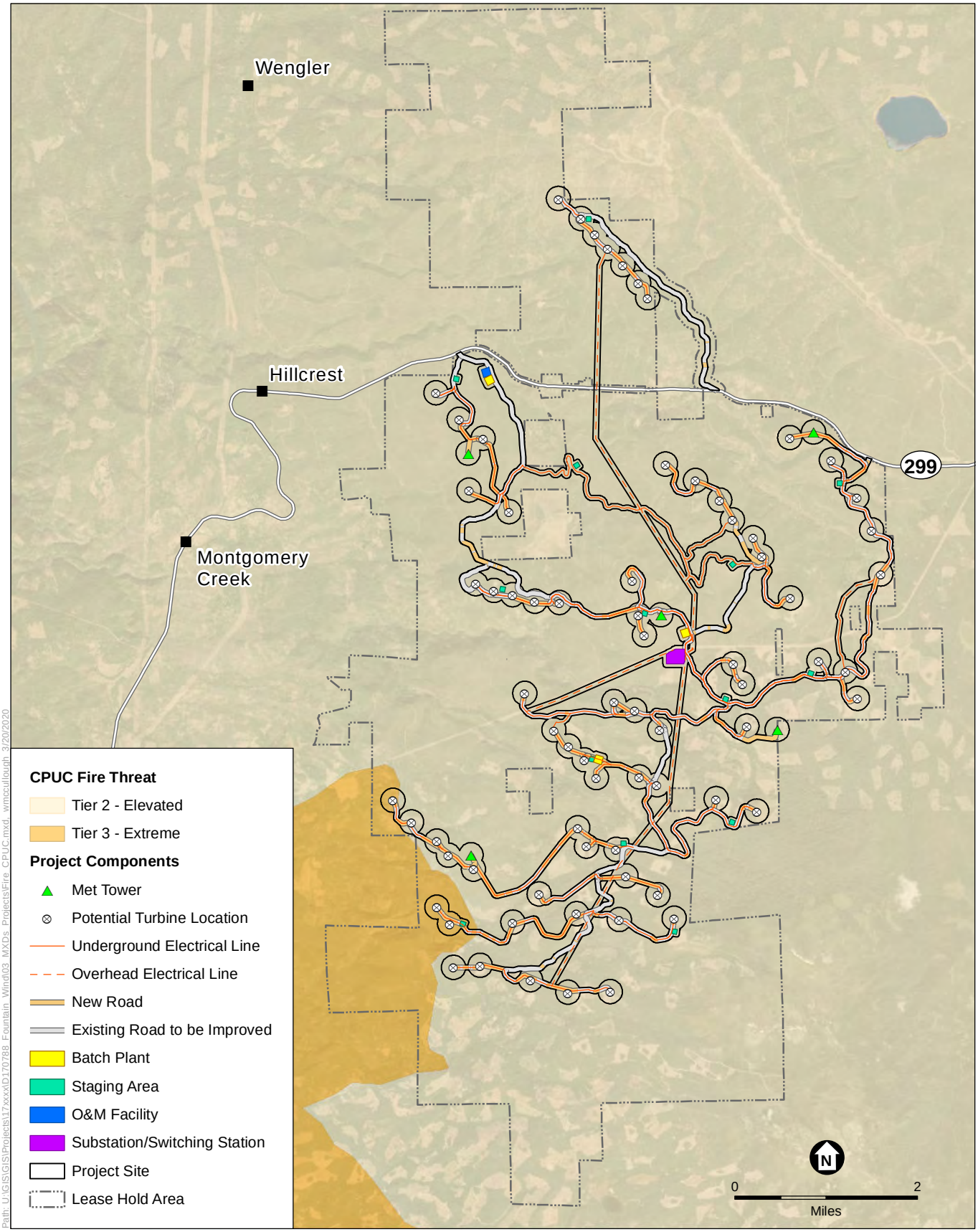
In response to Fire Safety Rulemaking of the California Public Utilities Commission (CPUC), the CPUC mapped high fire threat areas where more stringent inspection, maintenance, vegetation clearance, and wire clearance requirements (as required by CPUC General Orders 95, 165, and 166, described below) would be implemented due to the elevated risk for a devastating wildfire and damage to electrical lines. The CPUC High Fire Threat District Map identifies three tiers of elevated risk for fires associated with utilities. As shown in **Figure 3.16-2**, *CPUC Fire Threat*, the entire Project Site is located within Tier 2 Fire Threat District except for turbine locations M03, N01, and N01A which are within a Tier 3 fire district. Tier 2 areas are defined as areas "where there is an elevated risk (including likelihood and potential impacts on people and property) from wildfires associated with overhead utility power lines. Tier 3 areas are defined as areas "where there is an extreme risk (including likelihood and potential impacts on people and property) from utility associated wildfires" (CPUC, 2020).

[1] Crown fires are fires that burns in the crowns of trees and shrubs, and are usually ignited by a surface fire. Crown fires are common in coniferous forests and chaparral-type shrublands.



Fountain Wind Project

Figure 3.16-1
CalFire - Fire Hazard Severity Zones



Fountain Wind Project

Figure 3.16-2
CPUC Fire Threat

Factors Contributing to Impacts from Wildfire

Land Use Planning and Population

Land use in the Project Site is exclusively managed forest lands. Surrounding the Project Site, land use includes mostly managed forest lands and scattered rural communities, including Moose Camp (75 people, adjacent to the Project Site), Montgomery Creek (163 people, 2 miles west of the Project Site), and Round Mountain (155 people, 5 miles southwest of the Project Site). Each of these communities is located within a Wildland-Urban Interface (WUI) Intermix area, defined as an area with greater than 6.18 houses per square kilometer and greater than or equal to 50 percent cover of wildland vegetation (USFS, 2015). Therefore, the Project Site is located adjacent to an area designated as a WUI Intermix. Burney, while not considered a WUI Intermix area, is the largest town in the Project vicinity with a population of just over 3,000. It is located approximately 5.5 miles east of the Project Site.

Transportation and Emergency Access

As described in Section 3.14, *Transportation*, the primary road within the Project Site is State Route (SR) 299, which has one travel lane in each direction and paved shoulders. In the event of an evacuation from any of the communities listed above, SR 299 would be the primary evacuation route. Moose Camp residents would typically use Moose Camp Road for egress to SR 299, but if necessary could use G Line Road, which runs through the Project Site, for alternative access to SR 299. No other communities would use roads internal to the Project Site for evacuation.

Impact of Wildfire on Air Quality

As wildfires burn fuel, large amounts of carbon dioxide, black carbon (a pure carbon component of fine particulate matter typically present in soot), brown carbon (along with black carbon, a heat-trapping substance that contributes to climate change), and ozone precursors are released into the atmosphere. Additionally, wildfires emit a substantial amount of volatile and semi-volatile organic materials and nitrogen oxides that form ozone and organic particulate matter. These emissions can lead to harmful exposures for first responders, nearby residents, and populations in regions that are farther from wildfire (NOAA, 2018). Exposure to these pollutants can cause asthma attacks, coughing, and shortness of breath. Chronic exposure to these pollutants can increase the risk of developing chronic health conditions such as heart disease, diabetes, and cancer (Hamers, 2018; Milman, 2018). The pollutants that contribute to adverse human health effects are described in more detail in Section 3.3, *Air Quality*. The pollutants that contribute to climate change are described in Section 3.10, *Greenhouse Gas Emissions*.

Hydrology, Drainage, and Landslide Potential

As described in detail in Section 3.12, *Hydrology and Water Quality*, there are approximately 8 miles of streams, creeks, and intermittent streams within the Project Site. Multiple surface waters generally flow from east to west/northwest through the Project Site. While the Project Site is located in an area of minimal flood risk, there is potential for flood flows within the Project Site to be flashy in the winter months, with substantial surface runoff flowing across the Project Site toward streams that ultimately feed into the Sacramento River. Timber harvesting activities

in the region have affected surface waters through delivery of silt, sediment, and increasing turbidity through runoff; therefore, it can be expected that vegetation losses due to fire may also result in erosion potential and contribute silt and sediment to local waters.

As described in Section 3.9, *Geology and Soils*, the Shasta County General Plan mentions that landslides are known to occur throughout the county, and are especially prevalent in its northern and eastern areas. Available geologic mapping shows no landslide deposits within the Project Site (Dupras, 1997). However, according to topographic maps provided by the U.S. Geological Survey (USGS), the Project Site includes relatively steep slopes (USGS, 2018a, 2018b) where landslides, debris flows, or rock falls could occur.

3.16.1.3 Regulatory Setting

Federal

National Fire Plan

The National Fire Plan (NFP) was created to address fire protection strategies for rural communities. Together, the USDA Forest Service and the Department of the Interior are working to successfully implement key points outlined in the NFP, including firefighting, rehabilitation, hazardous fuels reduction, community assistance, and accountability (USDA, 2002).

National Cohesive Wildland Fire Management Strategy

The Federal Wildland Fire Management Policy is intended to provide strategic consistency among federal agency fire management programs. The *Guidance and Implementation of Federal Wildland Fire Management Policy* (USFS et al., 2009) replaces the *Interagency Strategy for the Implementation of Federal Wildland Fire Management Policy* (National Association of State Foresters et al., 2003) and clarifies changes that have occurred since 2003, while providing revised direction for consistent implementation of the *Review and Update of the 1995 Federal Wildland Fire Management Policy* (USDOI, 2001).

North American Electric Reliability Corporation Standards

To improve the reliability of regional electric transmission systems, the North American Electric Reliability Corporation (NERC) developed a transmission vegetation management program for all transmission lines operated at 200 kilovolts (kV) and above, and to lower voltage lines designated by the Regional Reliability Organization as critical to the reliability of the regional electrical system. Developed in 2006, requirements of the program govern clearances between vegetation and any overhead, ungrounded supply conductors must be identified and documented, while considering transmission line voltage; effects of ambient temperature on conductor sag under maximum design loading; fire risk; line terrain and elevation; and effects of wind velocity on conductor sway. The clearances identified must be no less than those set forth in Institute of Electrical and Electronics Engineers Standard 516-2003.

State

2018 Strategic Fire Plan for California

Developed by the Board of Forestry and Fire Protection (the Board), the Strategic Fire Plan outlines goals and objectives to implement CAL FIRE's overall policy direction and vision. The 2018 Plan demonstrates CAL FIRE's focus on: (1) fire prevention and suppression activities to protect lives, property, and ecosystem services; and (2) natural resource management to maintain the State's forests as a resilient carbon sink to meet California's climate change goals and to serve as important habitat for adaptation and mitigation.

Through the Strategic Plan, CAL FIRE implements and enforces the policies and regulations set forth by the Board and carries forth the mandates of the Governor and the Legislature (CAL FIRE and Shasta County Fire, 2018). The plan focuses on promoting interagency coordination, participating in the development of regional and local planning efforts, sharing risk assessment data, integrating fuels management practices across jurisdictions, and providing the appropriate level of resources and preparedness to enable fire suppression activities and post-fire recovery at the unit level. The goals and objectives of the Plan would not directly apply to the Project.

Unit Plans are developed and updated in order to implement the programs and goals of the 2018 Strategic Fire Plan. The 2018 Shasta-Trinity Unit Strategic Fire Plan outlines strategies for how the Shasta-Trinity Unit will implement and meet the goals in the overall Strategic Fire Plan (CAL FIRE and Shasta County Fire, 2018). The Shasta-Trinity objectives focus on coordination with relevant stakeholders, increasing communication and planning coordination within communities, and improving the prescribed burning program. The goals and objectives would not be directly applicable to the Project.

California Public Utilities Commission General Orders

The California Public Utilities Commission (CPUC) regulates private investor-owned utilities in the state of California, including electric power companies like PG&E as well as natural gas, telecommunications, and water companies. Rules established by the CPUC are called "General Orders" or "GOs." PG&E's construction of the electrical connections to its infrastructure (as described in Section 2.4.3, *Project Substation, Switching Station and Interconnection Facilities*. Would be subject to the CPUC General Orders summarized below because PG&E is an investor-owned utility. Aspects of the Project to be constructed by the Applicant, such as the switching station and collector lines) would not be subject to the General Orders because the Applicant is not an investor-owned utility.

General Order 95

CPUC General Order 95 applies to construction and reconstruction of overhead electric lines. The replacement of poles, towers, or other structures is considered reconstruction and requires adherence to all strength and clearance requirements of this order. CPUC Decision 17-12-024 created enhanced requirements under Rule 18A, Rule 35, and Rule 38, which apply to overhead electric lines located in Tier 2 or Tier 3 High Fire Threat Districts (HFTDs). The CPUC has promulgated various rules to implement the fire safety requirements of General Order 95, including the following (CPUC, 2018):

- Rule 18A, which requires utility companies take appropriate corrective action to remedy Safety Hazards and General Order 95 nonconformances. Additionally, this rule requires that each utility company establish an auditable maintenance program.
- Rule 31.2, which requires that lines be inspected frequently and thoroughly.
- Rule 35, which requires that vegetation management activities be performed in order to establish necessary and reasonable clearances. These requirements apply to all overhead electrical supply and communication facilities that are covered by this General Order, including facilities on lands owned and maintained by state and local agencies.
- Rule 38, which establishes minimum vertical, horizontal, and radial clearances of wires from other wires.

General Order 165

General Order 165 establishes requirements for the inspection of electric distribution and transmission facilities that are not contained within a substation. Utilities must perform "Patrol" inspections, defined as a simple visual inspection of utility equipment and structures that is designed to identify obvious structural problems and hazards, at least once per year for each piece of equipment and structure. "Detailed" inspections, where individual pieces of equipment and structures are carefully examined, are required every 5 years for all overhead conductor and cables, transformers, switching/protective devices, and regulators/capacitors. By July 1 of each year, each utility subject to this General Order must submit an annual report of its inspections for the previous year under penalty of perjury (CPUC, 2017a).

General Order 166

General Order 166 Standard 1.E requires that Investor Owned Utilities (IOUs)2 such as PG&E develop a Fire Prevention Plan, which describes measures that the electric utility will implement to mitigate the threat of power line fires generally. Additionally, this standard requires that IOUs outline a plan to mitigate power line fires when wind conditions exceed the structural design standards of the line during a Red Flag Warning[3] in a high fire threat area. Fire Prevention Plans created by IOUs are required to identify specific parts of the utility's service territory where the conditions described above may occur simultaneously. Standard 1 also requires that utilities prepare an emergency response plan. PG&E's Emergency Response Plan, prepared in compliance with Standard 1, is described below. Standard 11 requires that utilities report annually to the CPUC regarding compliance with General Order 166 (CPUC, 2017b). In compliance with Standard 1.E of this General Order, PG&E adopted a Fire Prevention Plan on September 30, 2017.

PG&E Company Emergency Response Plan

PG&E's Company Emergency Response Plan describes and formalizes PG&E's in-place plans and protocols for response to emergencies. The identifies potential hazards, available resources to respond to emergencies, internal communication protocols, and operational structure. Additionally, PG&E's Wildfire Safety Operations Center operates 24-hours a day during wildfire season (PG&E, 2018).

2 Investor-owned utilities (IOUs) are private electricity and natural gas providers. The CPUC oversees IOUs.

3 A Red Flag Warning is issued by the National Weather Service to alert fire departments of the onset, or possible onset, of critical weather and dry conditions that could lead to rapid or dramatic increases in wildfire activity.

PG&E Fire Prevention Plan

PG&E prepared a Fire Prevention Plan in compliance with CPUC Decision 12-01-032 (Fire Safety Order), Standard 1.E of General Order 166, and Senate Bill 1028. The Fire Prevention Plan summarizes PG&E's fire prevention and safety procedures and programs which include, but are not limited to: fire threat and risk area mapping, fire prevention pre-planning, enhanced fire detection efforts, building resiliency (including a wood pole test and treat program), operational practices to reduce the risk of fires, overhead inspections and patrols, fire prevention outreach and training programs, as well as pro-active responses to fire incidents (PG&E, 2017).

PG&E's operational practices consider environmental conditions such as vegetation type, vegetation moisture content, relative humidity, temperature, and wind conditions. Considering these variables, PG&E created Utility Standard S1464, "Fire Danger Precautions in Hazardous Fire Areas," which includes operational requirements for working and operating in areas that are considered high fire risk during the fire season (these areas are designated in Attachment 3 to the Fire Prevention Plan as either "Extreme" or "Very High" fire danger). According to Attachment 3, the Project is proposed in an area rated as "Very High." Utility Standard S1464 requires that crews working in these areas in the fire season carry firefighting equipment; prohibits personnel traveling in these areas from burning, welding, blasting, smoking, and driving off cleared road; and restricts testing any section of line that relays until the line has been patrolled and all trouble cleared.

California Emergency Response Plan

Pursuant to the Emergency Services Act (Government Code §8550 et seq.), California has developed an Emergency Plan to coordinate emergency services provided by federal, State, and local governmental agencies and private persons. The plan is administered by the State Office of Emergency Services (OES). OES coordinates the responses of other agencies, including the United States Environmental Protection Agency, California Highway Patrol, California Department of Fish and Wildlife, the Regional Water Quality Control Boards (RWQCBs) (for this Project, the Central Valley RWQCB), the local air districts (for this Project, the Shasta County Air Quality Management), and local agencies. The State Emergency Plan defines the "policies, concepts, and general protocols" for the proper implementation of the California Standardized Emergency Management System (SEMS). The SEMS is an emergency management protocol that agencies within the State of California must follow during multi-agency response efforts.

Fire Protection in California Fire Code and Public Resources Code

The California Fire Code is contained within Title 24, Part 9 of the California Code of Regulations. Based on the International Fire Code, the California Fire Code is created by the California Buildings Standards Commission and regulates the use, handling, and storage requirements for hazardous materials at fixed facilities. Similar to the International Fire Code, the California Fire Code and the California Building Code use a hazards classification system to determine the appropriate measures to incorporate to protect life and property.

The California Public Resources Code includes fire safety provisions that apply to SRAs during the time of year designated as having hazardous fire conditions. During the fire hazard season,

these regulations restrict the use of equipment that may produce a spark, flame, or fire; require the use of spark arrestors on equipment that has an internal combustion engine; specify requirements for the safe use of gasoline-powered tools in fire hazard areas; and specify fire-suppression equipment that must be provided on-site for various types of work in fire-prone areas. Additional codes require that any person who owns, controls, operates, or maintains any electrical transmission or distribution line must maintain a firebreak clearing around and adjacent to any pole, tower, and conductors that carry electric current as specified in Pub. Res. Code §§4292 and 4293. Section 4292 requires that a 10-foot zone around the base of poles be cleared of all flammable vegetation. The State's Fire Prevention Standards for Electric Utilities (14 Cal. Code Regs. §§1250–1258) provide specific exemptions from electric pole and tower firebreak and electric conductor clearance standards and specifies when and where standards apply.

Pub. Res. Code §4119 authorizes CAL FIRE or its authorized agent to inspect properties to determine whether they comply with state forest and fire laws, regulations, or use permits. Section 4427 limits the use of any motor, engine, boiler, stationary equipment, welding equipment, cutting torches, tarpots, or grinding devices which may generate a spark or flame if the equipment is located on or near forested land or land covered in bush or grass. Section 4427 establishes requirements such as clearing flammable material within 10 feet of the area of operation, as well as carrying of fire response equipment such as a shovel, backpack pump water type fire extinguisher.

Pub. Res. Code §4428 limits industrial operations by requiring certain firefighting equipment to be used when operating internal combustion engines on or near land covered by forest bush or grass between April 1 and December 1 of any year, or other times when ground litter and vegetation could sustain combustion and facilitate the spread of fire. Section 4428 requires that such work provide and maintain the following tools:

- A sealed box of tools containing a backpack pump-type fire extinguisher filled with water, two axes, two McLeod fire tools, and a shovel for each worker onsite must be in near the operating area in a manner that would be accessible in the event of a fire.
- At least one serviceable chainsaw or timber felling tools must be provided and maintained.
- Each passenger vehicle must be equipped with a shovel and an ax, and every other vehicle or tractor must have a shovel.

Pub. Res. Code §4431 requires users of gasoline-fueled internal combustion-powered equipment located within 25 feet of forest, brush, or grass to keep firefighting tools at the immediate location of use. The Director of Forestry and Fire Protection administers and specifies the type and size of fire extinguisher necessary to provide at least minimum assurance of controlling fire caused by use of portable power tools under various climatic and fuel conditions. In addition, Section 4442 restricts the use and operation of any internal combustion engine that uses hydrocarbon fuels on any forest, brush, or grass areas unless the engine is equipped with a spark arrestor, as defined in Pub. Res. Code §4442(c) and pursuant to §4443.

Defensible Space and the Fire Safe Regulations

State law requires a minimum clearance (defensible space) of 100-feet around structures (Pub. Res. Code §§4290, 4291). Implementing regulations (the "Fire Safe Regulations") provide

related requirements to be implemented in a SRA including road standards for fire equipment access (14 Cal. Code Regs. §1273 et seq.); standards for signs identifying streets, roads, and buildings (14 Cal. Code Regs. §1274 et seq.); requirements for minimum private water supply reserves for emergency fire use (14 Cal. Code Regs. §1275 et seq.); and requirements for fuel breaks such as defensible space and greenbelts (14 Cal. Code Regs. §§1272, 1276 et seq.).

Forest Practice Act and the Forest Practice Rules

The Z'Berg-Nejedly Forest Practice Act of 1973 (Pub. Res. Code §§4511–4360.2) and its implementing regulations, the Forest Practice Rules (14 Cal. Code Regs. §895 et seq.), govern the management of privately owned forestlands in California, including with respect to wildfire. For example, Rule 938.4 governs smoking and matches (14 Cal. Code Regs. §938.4) and Rule 938.7 governs blasting and welding (14 Cal. Code Regs. §938.7).

Local

Shasta County General Plan

Shasta County General Plan Element 5.4, Fire Safety and Sheriff Protection, "discusses conditions and issues relevant to the protection of public health and safety from fire damage" (Shasta County, 2018). The following applicable objectives and policies guide County planning with regard to fire safety.

Objectives:

***FS-1*:** Protect development from wildland and non-wildland fires by requiring new development projects to incorporate effective site and building design measures commensurate with level of potential risk presented by such a hazard and by discouraging and/or preventing development from locating in high risk fire hazard areas.

***FS-2*:** Protection of life and property from crime by encouraging new development projects to incorporate effective defensible space design techniques.

Policies:

***FS-a*:** All new land use projects shall conform to the County Fire Safety Standards.

***FS-b*:** Known fire hazard information should be reported as part of every General Plan amendment, zone change, use permit, variance, building site approval, and all other land development applications subject to the requirements of the California Environmental Quality Act (CEQA).

Shasta County Fire Safety Standards

The Shasta County Board of Supervisors has adopted Fire Safety Standards for development projects in Shasta County. The standards meet or exceed the State's standards and are inclusive of "State Responsibility Area Fire Safe Regulations." These development standards address access, road widths, bridges, building construction, and hydrant and water systems and include a section on mitigation measures. All standards would be administered and implemented by the County Fire Warden, any designees, and as otherwise authorized by the Board of Supervisors by adoption of the standards (Shasta County, 2017).

Western Shasta Community Wildfire Protection Plan

The Western Shasta Resource Conservation District (WSRCD) has established a Community Wildfire Protection Plan (CWPP) for areas within Battalion 2. The goal of the CWPP is to reduce the destruction and associated costs from wildfire by creating shaded fuel breaks, increase homeowner and fire department access and egress, watershed restoration and public information and education on developing Firewise Communities. Several shaded fuel breaks along county roads and SR 299 East surrounding the communities of Oak Run, Hillcrest, Montgomery Creek, and Round Mountain have been initiated by WSRCD (Shasta County, 2016). However, according to Map 1 in the CWPP, only a small southern portion of the Project Site would be located within the CWPP designated area in Cow Creek. The majority of the northern portion of the Project Site would be undesignated within the CWPP (Shasta County, 2016).

Shasta County Multi-Jurisdictional Hazard Mitigation Plan

The Shasta County Multi-Jurisdictional Hazard Mitigation Plan (SCHMP) includes resources and information to assist in planning for hazards. The SCHMP provides a list of actions that may assist participating jurisdictions in reducing risk and preventing loss from future hazard events, and addresses wildfire hazards (Shasta County and City of Anderson, 2017).

3.16.2 Significance Criteria

A project proposed to be located in or near state responsibility areas or lands classified as very high fire hazard severity zones would result in a significant impact related to wildfire if it would:

a) Substantially impair an adopted emergency response plan or emergency evacuation plan;

b) Due to slope, prevailing winds, and other factors, exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations or a significant risk of loss, injury or death from a wildfire or the uncontrolled spread of a wildfire;

c) Require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment; or

d) Expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

3.16.3 Direct and Indirect Effects

3.16.3.1 Direct and Indirect Effects of the Project

a) Whether the Project would substantially impair an adopted emergency response plan or emergency evacuation plan.

Impact 3.16-1: The Project would, unless mitigated, substantially impair an adopted emergency response plan or emergency evacuation plan. ***(Less than Significant with Mitigation Incorporated)***

There are no specifically designated evacuation routes described in the Community Wildfire Protection Plan or the Shasta County General Plan. However, because the Project would be

developed in a rural area, the number of access roads to and exit routes from the site is limited. The main access road and potential evacuation route would be SR 299, which bisects the Project Site. The three Project driveways, as described in Section 2.1.1.1, *Access Roads*, and in Section 3.14, *Transportation*, would allow adequate egress/ingress to and through the Project Site in the event of an onsite emergency. Additional onsite access roadways also would be constructed within the Project Site, which would provide additional access for firefighting purposes and serve as man-made, maintained firebreaks.

The Project would not require closures of public roads, which could inhibit access by emergency vehicles. However, the presence of oversized construction vehicles on local roads (such as SR 299, or G Line Road in the event of an emergency requiring use of that road to evacuate Moose Camp) could cause blockage that may impede other traffic if a wildfire were to occur in the area during the construction or decommissioning periods, resulting in a potentially significant impact.

The implementation of Mitigation Measure 3.14-3 (provided in Section 3.14) would ensure that emergency access would be maintained during construction and decommissioning and thus would reduce this impact to less than significant.

> **Mitigation Measure 3.16-1a:** Implement Mitigation Measure 3.14-3 (Traffic Management Plan)
>
> **Significance after Mitigation:** Less than significant.

Mitigation Measure 3.14-3 would ensure that the Project's proposed use of oversized vehicles during construction and decommissioning would not cause a significant adverse impact on emergency access to or near the Project Site. The Traffic Management Plan would require consultation with emergency service providers, Caltrans, and residents in the vicinity and would specify timing of oversized vehicle travel. Advance notices would also be given to local fire departments and to the sheriff's department to ensure that response times could be maintained. Additionally, all oversize load permits and related requirements would be complied with. Mitigation Measure 3.14-3 would reduce the impact to emergency response and evacuation plans to less than significant with mitigation incorporated.

As described in Section 3.16.1.3, *Regulatory Setting*, the 2018 Strategic Fire Plan for California outlines overarching goals for CAL FIRE, and the 2018 Shasta Trinity Unit Strategic Fire Plan identifies strategies for unit implementation of the statewide plan. Also as described in the Regulatory Setting, the CWPP would not apply to those areas of the Project Site that it does not encompass. Furthermore, the CWPP does not explicitly outline any emergency response or evacuation plans. Because these plans do not directly apply to the Project, the Project would not conflict with or impair the implementation of either of these plans.

As described in Section 3.16.1.1, the CAL FIRE Shasta-Trinity Unit has access to firefighting aircraft which drop either fire retardant or water in strategic locations to fight spreading fires. Firefighting aircraft need to fly at low elevations (between 150 feet and 500 feet from the ground) to have accurate drops of retardant or water (CAL FIRE, 2019b; AHSAFA, 2020). Within the

Project Site, peaks and buttes present existing obstacles for aerial firefighting. Near the Project Site, the Hatchet Wind Project includes vertical turbines that are approximately 420 feet tall. These turbines are existing vertical structures that could be obstacles for aerial firefighting. As described in Section 2.4.1, *Wind Turbine Generators*, the turbines could have heights of up to 679 feet. Some research on the impact of wind turbines on aerial firefighting concludes that wind turbines "do not cause aircraft concern in aviation operations for [firefighting]" and that "Where vertical obstructions exist in the airspace around a fire such as power lines, weather masts, radio and television transmission towers, tall trees and wind turbines, a dynamic risk assessment is undertaken prior to the aircraft being committed to fire-bombing operations" (Commonwealth of Australia, 2015).

Due to the spacing between rows of turbines, aerial firefighting operations are likely to have enough space even with the proposed Project to continue aerial firefighting operations within the Project Site. However, due to the height of the turbines, construction and operation of the Project could interfere with aerial firefighting operations, a potentially significant impact. To ensure that impacts related to aerial firefighting during construction and operation are reduced to less than significant, implementation of **Mitigation Measure 3.16-1b** (Pre-Construction Coordination with CAL FIRE) would be required.

> **Mitigation Measure 3.16-1b: Pre-Construction Coordination with CAL FIRE**
>
> Prior to construction, the Applicant shall provide GIS files or other maps of the Project layout to CAL FIRE to facilitate aerial fire-fighting planning. The Applicant shall notify CAL FIRE of any changes to the Project layout or any maintenance that would require the use of helicopters or the use of equipment not previously identified on maps provided to CAL FIRE that could present a new, previously unidentified vertical obstacle to aerial firefighting.
>
> **Significance after Mitigation:** With implementation of Mitigation Measure 3.16-1b, CAL FIRE would have the information necessary to plan for aerial firefighting with the Project in place. This would allow CAL FIRE to identify locations for retardant or water drops within the Project Site and would allow for the planning of flight plans around the Project Site. With the implementation of Mitigation Measure 3.16-1b, impacts would be reduced to a less-than-significant level.

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b) Due to slope, prevailing winds, and other factors, whether the Project would exacerbate wildfire risks, and thereby expose project occupants to, pollutant concentrations or a significant risk of loss, injury or death from a wildfire or the uncontrolled spread of a wildfire.

Impact 3.16-2: The Project would, unless mitigated, exacerbate wildfire risks and expose people to pollutant concentrations or a significant risk of loss, injury or death from a wildfire or the uncontrolled spread of a wildfire. (*Less than Significant with Mitigation Incorporated*)

The Project is not intended for and would not be used for human occupation; therefore, no occupants would be exposed to increased risks associated with wildfire. However, the Project Site

is located near existing communities. Therefore, the following analysis focuses on the potential for Project Site preparation, construction, operation and maintenance (O&M), and decommissioning to increase the exposure of the occupants of these communities to wildfire risks.

As discussed in Section 3.16.1, *Environmental Setting*, and shown on Figure 3.16-1, the entire Project is located within a very high fire hazard severity zone. Approximately 4,353 acres of the Project Site are located in a CPUC Tier 2 Fire Threat District and 110 acres are located within a Tier 3 Fire Threat District. The primary fire hazards from Project activities during construction and decommissioning would involve the use of vehicles and equipment. Heat or sparks from vehicles and equipment could ignite dry vegetation and cause a fire, particularly during drier, warmer conditions.

Additionally, construction activities that could result in sparks, such as blasting, welding, or grinding, have a greater likelihood of creating a source of ignition. For example, the Ranch Fire in 2018 was determined by CAL FIRE to have been caused by an individual hammering a metal stake into concrete (Sacramento Bee, 2019).

The Project would result in increased vehicle activity on local and regional roads due to trucks and vehicles delivering equipment to the site, which could result in an increased potential for ignitions. Therefore, depending on the time of year (as seasonality may affect climate conditions, prevailing winds, and vegetation/fuels) and the location of construction activities, the increase in sources of potential ignition associated with Project construction or decommissioning could exacerbate the risk of wildfire in the area. As discussed in the Environmental Setting, wildfires release large amounts of air pollutants, which can lead to harmful exposure for first responders, nearby communities, and populations that are located farther away. Therefore, due to the increase in potential sources of ignition, Project construction and decommissioning could increase the risk of surrounding communities' exposure to pollutant concentrations from wildfire and the uncontrolled spread of wildfire to a level that is substantially higher than existing than baseline conditions, which would result in a potentially significant impact.

To ensure that wildland fire impacts during construction and decommissioning are reduced to less than significant, implementation of **Mitigation Measure 3.16-2a** (Fire Safety) would be required. The implementation of a Project-specific Fire Prevention Plan would reduce potential sources of ignition and require immediate and effective suppression measures. The plan would specify that when the National Weather Service issues a Red Flag Warning (an alert that high winds and dry conditions could lead to rapid or dramatic increases in wildfire activity), the Applicant and its contractor must cease all non-emergency work to respond to changes in fire risk. Additionally, the plan would prepare work crews with emergency suppression equipment and plans to respond quickly to any onsite incidents caused by construction activities.

The implementation of Mitigation Measure 3.16-2a would reduce the potential for an onsite ignition during construction by limiting the types of acceptable work during Red Flag Warnings, requiring that vegetation clearances be maintained, and ensuring that potential ignitions sources are minimized. Additionally, Mitigation Measure 3.16-2a would provide the construction crews

with the training and tools necessary to respond quickly to a potential fire, preventing the spread of fire. The incorporation of a Project-specific Fire Prevention Plan would reduce the risk of the spread of wildfire from Project construction and decommissioning to near baseline conditions. This would reduce Project impacts to a less-than-significant level.

The Project would include the O&M of up to 72 turbines, underground and aboveground collector systems, and a substation and switching station. Project O&M would increase the potential for accidental ignition due to mechanical failures such as turbine overload, the overheating of moving parts, a collector line failure, or a structure fire involving the substation. Sparks created by any of these mechanical failures could ignite surrounding flammable material. Additionally, due to the height of the turbines, lightning strikes also could result in the ignition of a fire within the turbine.

In accordance with applicable firebreak clearance requirements (Pub. Res. Code §4292; 14 Cal. Code Regs. §1254), the Applicant would trim or remove flammable vegetation in the area surrounding power lines to reduce potential fire and other safety hazards. Also, in accordance with tree and power line clearance requirements (Pub. Res. Code §4293; 14 Cal. Code Regs. §1256), the Applicant would regularly inspect vegetation and trim trees to manage fire and safety hazards and ensure electrical reliability for all Project collector lines constructed overhead. As described in Section 2.4.1, *Wind Turbine Generators*, a 15-foot gravel ring would be placed around the base of the foundation of turbines and maintained free of vegetation and an area of between 65 and 95 feet in diameter (depending on site conditions) would be removed from timber production and maintained as low-growing vegetation.

As described in Section 2.4.2.2, *Overhead Collector System*, an approximately 80-foot-wide corridor would be maintained around the overhead collector system and cleared of tall woody vegetation. Additionally, as described in Section 2.4.4.2, *Temporary Construction and Equipment Areas*, prior to operation, the Applicant would prepare a Vegetation Management Plan that would outline vegetation management procedures to be implemented onsite pursuant to all applicable state regulations listed above pertaining to electrical systems, and would include vegetation management for all other components of the Project as well.

Compliance with the above operational and vegetation clearance requirements would reduce the risk of exposing surrounding communities to exacerbated risk of the uncontrolled spread of a wildfire during Project operation. However, operation of the Project would introduce new energy facilities and activities that could result in sparks or flames that could result in a wildfire that could spread beyond the Project site. This risk would create a potentially significant impact with regard to the spread of wildland fire.

Mitigation Measure 3.16-2a requires that a Fire Prevention Plan be developed and implemented during the Project's construction, operation, and decommissioning periods. Mitigation Measure 3.16-2a requires that maintenance activities include appropriate fire prevention measures. Additionally, Mitigation Measure 3.16-2a requires that the Fire Prevention Plan identify meteorological monitoring systems to identify fire-prone conditions, requires inspection of turbines and electrical infrastructure, and requires a protocol for disabling reclosers and de-

energizing the electrical distribution system. **Mitigation Measure 3.16-2b** would require that all turbines be equipped with fire detection and prevention technology compatible with manufacturers operating requirements, and will be maintained in good working order throughout the life of the Project. Finally, **Mitigation Measure 3.16-2c** would require that the Applicant create and coordinate an emergency response plan with local emergency responders.

The implementation of these mitigation measures would reduce the risk of ignition resulting from operation of the Project to near baseline levels by requiring Project turbines to be fitted with fire detection equipment, fire extinguishment equipment, and an automatic shutdown system. The incorporation of these features into turbine design would reduce the potential of a fire igniting within a turbine. Additionally, implementation of these measures would provide the full-time operation workers with the tools and training necessary to respond to a potential fire and prevent it from spreading.

Therefore, the implementation of Mitigation Measures 3.16-2b and 3.16-2c would reduce the risk of such an ignition spreading wildfire and/or wildfire-related pollution to surrounding communities. With the implementation of Mitigation Measure 3.16-2a, Mitigation Measure 3.16-2b, and Mitigation Measure 3.16-2c, impacts would be less than significant.

Mitigation Measure 3.16-2a: Fire Safety.

The Applicant and/or its contractors shall prepare and implement a Project-specific Fire Prevention Plan (FPP) to prevent an exacerbation of wildfire risk during both the Project construction and operation and maintenance phases. Prior to construction, the Applicant shall contact and consult with the Shasta Trinity Unit of CAL FIRE and the Shasta County Fire Department to determine the appropriate amounts of fire equipment to be carried on the vehicles and appropriate prevention measures to be taken. The Applicant shall submit verification of its consultation with the appropriate fire departments to Shasta County. The Applicant shall submit a draft FPP to the Shasta County Department of Resource Management, Planning Division for approval when the building permit application is submitted. The County shall have an opportunity to make comments on and revisions to the FPP, which the Applicant shall incorporate into a revised FPP for approval. The Applicant shall make the approved FPP available to all construction crew members prior to construction of the Project. The FPP shall list fire safety measures including fire prevention and extinguishment procedures, as well as specific emergency response and evacuation measures that would be followed during emergency situations; examples are listed below. The FPP also shall provide fire-related rules for smoking, storage and parking areas, usage of spark arrestors on construction equipment, and fire-suppression tools and equipment. The FPP shall include or require, but not be limited to, the following:

- Prior to construction, the Project applicant shall designate primary and alternate Fire Coordinators such that a Fire Coordinator is present at all times during Project construction. The Fire Coordinator shall be responsible for ensuring that crews have sufficient fire suppression equipment, communication equipment, shall lead and coordinate fire patrols, ensure that the required clearances are followed onsite, and ensure that all crew members receive training on the FPP and its components.

- For vehicles within control of the contractor, the contractor shall require vehicle drivers to conduct a visual inspection of the vehicle for potential sparking risks prior to operation of the vehicle. This inspection should include, but not be limited to a

check of tire pressure and an inspection for chains or other vehicle components that could drag while driving. For subcontractors or vendors where vehicles are not within the control of the contractor, the contractor or Applicant shall develop a standard brochure to send to vendors that shall provide educational materials about fire risks associated with vehicles and shall provide an inspection checklist.

- The Applicant and/or its contractors shall have water tanks, water trucks, or portable water backpacks (where space or access for a water truck or water tank is limited) sited/available in the study area for fire protection.
- During construction of the Project the Applicant and/or its contractors shall implement ongoing fire patrols during construction hours and for 1 hour after the end of daily construction and hotwork.
- All construction crews and inspectors shall be provided with radio and/or cellular telephone access that is operational within the Project Site to allow communications with other vehicles and construction crews. All fires shall be reported immediately upon detection.
- Require that all internal combustion engines, stationary and mobile, be equipped with spark arresters in good working order.
- Require that light trucks and cars with factory-installed mufflers be used only on roads where the roadway is cleared of vegetation.
- Require that equipment parking areas and small stationary engine sites are cleared of all extraneous flammable material.
- Include a fire conditions monitoring program to monitor meteorological data during construction and operation.
- Include a monitoring and inspection protocol for turbines and electrical infrastructure.
- Include protocol for disabling re-closers and de-energizing portions of the electrical collection and transmission systems
- Prohibit smoking in wildland areas, with smoking limited to paved areas or areas cleared of all vegetation.
- All construction vehicles shall have fire suppression equipment.
- The Applicant shall ensure that all construction workers receive training on the implementation of the FPP including how to conduct a fire patrol, proper use of fire-fighting equipment and procedures to be followed in the event of a fire, vegetation clearance and equipment usage requirements, turbine, and electrical equipment inspections.
- As construction may occur simultaneously at several locations, each construction site shall be equipped with fire extinguishers and fire-fighting equipment sufficient to extinguish small fires.
- The Applicant shall enforce a requirement that construction personnel park any vehicles within roads, road shoulders, graveled areas, and/or cleared areas (i.e., away from dry vegetation) wherever such surfaces are present at the construction site.

- The Applicant and its contractor shall cease all non-emergency work during Red Flag Warning events.
- The Applicant shall coordinate the finalization of road improvements (i.e. frequency of grading and vegetation clearance) with CAL FIRE and other emergency responders to ensure that sufficient ingress and egress exists onsite.
- Prior to the initiation of construction, a designated inspector from the County and/or Shasta County Fire Department shall inspect the Project Site to ensure that sufficient fire suppression equipment is present onsite, that the required vegetation clearances have been cleared, that a crew member training program has been created, that construction vehicles are equipped with fire suppression equipment, that spark arrestors are installed on construction equipment, that a fire conditions monitoring program has been developed, that a monitoring and inspection protocol has been developed, that a disabling and re-closing protocol has been developed, and that CAL FIRE was appropriately consulted regarding road improvements and ingress and egress.
- During construction, the Applicant shall maintain and provide upon request by the County, CAL FIRE a weekly FPP compliance report that demonstrates the following: fire patrols have been conducted following construction, any new construction workers have received training on the implementation of the FPP, that non-emergency work is being halted appropriately during Red Flag Warnings, and that sufficient fire suppression equipment is present onsite.

Successful implementation of Mitigation Measure 3.16-2a (Fire Safety) would be demonstrated by the development of an FPP in consultation with local fire authorities which is documented and submitted to Shasta County for review, any revisions, and final approval. Additionally, successful implementation of Mitigation Measure 3.16-2a would require that the Applicant and its contractor comply with all components of the FPP, that ignition from Project construction activities is promptly reported to the fire department(s) with jurisdiction, and that when it is safe to do so, any Project-caused ignition is suppressed immediately.

Mitigation Measure 3.16-2b: Nacelle Fire Risk Reduction.

Turbines shall be equipped with fire detection and prevention technology compatible with the manufacturer's operating requirements and will be maintained in good working order throughout the life of the Project. Turbines with electrical equipment in the nacelle shall have safety devices to detect electrical arc and smoke that use the best available technology for fire detection and suppression within turbines. The turbine design shall include the following components:

1. Early fire detection and warning systems;
2. Automatic switch-off and complete disconnection from the power supply system; and
3. Automatic fire extinguishing systems in the nacelle of each wind turbine.
4. Additionally, turbines shall include lightning protection equipment such as grounding equipment, and a lightning measurement system.

Should any of these devices report an out-of-range condition, the device shall command a shutdown of the turbine and disengage it from the electrical collection system, and send a notice through the SCADA. The entire turbine shall be protected by current-limiting switchgear installed at the base of the tower.

In the event of a lightning strike, an electrical inspection shall be conducted on the affected turbine to identify and address any damage to the turbine or electrical system that could result in subsequent fire risk.

Mitigation Measure 3.16-2c: Emergency Response Plan.

Prior to the submission of the building permit application, the Applicant shall prepare an emergency response plan to be reviewed and approved by Shasta County Planning, CAL FIRE, and the Shasta County Fire Department. Following approval of the plan, the Applicant and/or its contractors shall implement the requirements in the plan during all phases of construction and operation, as applicable. The emergency response plan shall describe the likely types of potential accidents or emergencies involving fire that could occur during both construction and operation, and shall include response protocols for each scenario. The plan shall include key contact information and a description of key processes, in the event of an emergency in order to alert relevant responders of the emergency, and how to control the emergency. The plan shall include crew member training in response, suppression, and evacuation. The training shall be coordinated by the designated Fire Coordinators. Prior to construction, the Applicant shall submit to the County a compliance report demonstrating that all crew members have been trained. As new construction crews or operation workers are brought onsite, the Applicant shall submit additional compliance reports demonstrating that they have been received training on the emergency response plan. This plan may be combined with the Fire Prevention Plan (FPP).

Significance after Mitigation: Implementation of Mitigation Measure 3.16-2a (Fire Safety), Mitigation Measure 3.16-2b (Nacelle Fire Risk Reduction), and Mitigation Measure 3.16-2c (Emergency Response Plan) would require the Applicant and its contractors to implement fire safety measures to prevent fire and be prepared to respond immediately if a fire should ignite, and would require collaboration with area fire protection agencies to reduce the risk of wildfire ignition and spread. This impact would be reduced to a less-than-significant level.

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c) Whether the Project would require the installation or maintenance of associated infrastructure (such as roads, fuel breaks, emergency water sources, power lines or other utilities) that may exacerbate fire risk or that may result in temporary or ongoing impacts to the environment.

Impact 3.16-3: The Project would require the installation and maintenance of Project-related infrastructure (such as roads and power lines) that may exacerbate fire risk, and the installation and maintenance of fire suppression infrastructure (such as vegetation clearances and emergency water sources) that may result in temporary or ongoing impacts to the environment. (*Less-than-Significant Impact)*

As described in Section 2.4.4.1, *Access Roads*, existing roads would be used to the extent possible, but new roads are proposed as part of the Project. As described under Impact 3.16-2, the

vehicle activity on these new roads could result in a significant increased potential for ignitions by introducing new potential sources of ignition into vegetated areas that previously were at minimal risk from human-caused ignitions. The transportation-related aspects of Mitigation Measure 3.16-2a would reduce the increase in fire risk from new roads by requiring controls such as visual inspections for ignition sources (e.g., dragging chains) and carrying adequate fire suppression equipment.

The Project's overhead electrical collector systems are described in Section 2.4.2 and would include 34.5 kV collector lines installed on wood poles up to 90 feet tall and wire heights between approximately 20 to 30 feet above the ground (with greater wire clearances as needed). An approximately 80-foot-wide corridor would be maintained free of taller woody vegetation during operation. This vegetation clearance is consistent with or greater than guidance for clearance around power lines (e.g., CPUC General Order 95). The risk of ignition from these collector lines would be low because there would be a low risk of objects such as downed trees striking the lines or poles based on this minimum clearance. As a result, impacts would be less than significant.

The vegetation clearances that would be maintained around roads, collector lines, turbines, and other Project components would aid in reducing wildfire risk and facilitating emergency suppression of fires should they occur, consistent with defensible space guidelines. Because these clearances are part of the Project description, their construction and ongoing maintenance is analyzed as part of the Project where applicable throughout this EIR (e.g., in Section 3.4, *Biological Resources*, as relevant to wildlife habitat that would be removed to maintain clearances). Similarly, the water storage tank at the O&M facility is analyzed as part of the Project and the environmental impacts of the entire O&M facility are analyzed throughout this document on a resource-by-resource basis. No additional analysis of these fire prevention and suppression components of the Project is warranted in this impact discussion.

Mitigation: None required.

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d) Whether the Project would expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes.

Impact 3.16-4: The Project would, unless mitigated, expose people or structures to significant risks, including adverse water quality effects or downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes. (*Less than Significant with Mitigation Incorporated*)

The Project does not propose and would not require the construction of any housing; therefore, it would not expose people to increased risk associated with flooding, landslides, or post-fire slope instability as a result of locating housing near such existing risks. The following analysis focuses on the potential for the Project to result in post-fire downstream flooding, runoff, or landslides on nearby, downstream and downslope communities such as Moose Camp, Montgomery Creek, and Round Mountain.

As discussed under criterion b), implementation of the Project could increase wildfire risk as a result of increased sources of ignition. The implementation of Mitigation Measure 3.16-2a (Fire Safety), Mitigation Measure 3.16-2b (Nacelle Fire Risk Reduction), and Mitigation Measure 3.16-2c (Emergency Response Plan) would reduce potential sources of ignition and would prepare work crews to respond to incidents caused by construction equipment.

Post-fire conditions influence surface water quality because water flowing through burned areas is likely to carry increased levels of sediment, organic debris, and chemicals (such as residuals from fire suppressants), contributing to degradation of water quality and aquatic resources (Shasta County, 2016). Additionally, post-fire conditions can increase the potential for erosion and flooding due to the loss of vegetation that holds soils in place, causing increased erosion, and the loss of the water-absorbing properties of soils, causing increased runoff.

As identified in Section 3.12, *Hydrology and Water Quality*, criterion c), the implementation of a storm water pollution prevention plan (SWPPP) and best management practices (BMPs) related to erosion control would reduce potential impacts during construction related to drainage patterns to a less-than-significant level. Additionally, following construction, drainage patterns on-site would be relatively similar to existing conditions. Therefore, because the Project would implement fire prevention and suppression measures as well as erosion control and stormwater pollution prevention measures, the Project would not, as a result of post-fire conditions, result in changes to runoff or drainage patterns which could cause adverse water quality impacts or exacerbate downslope or downstream flooding and thereby expose people or structures to associated risks.

Additionally, as discussed in Section 3.9, *Geology and Soils*, under Impact 3.9-3, there are steep slopes and soil types within the Project Site where landslides could occur. In the event that a fire were to be ignited on the Project Site and were to spread outside of the Project Site, if significant amounts of vegetation were burned, the resultant change in drainage and soil stability could result in landsliding in downstream or downslope areas.

Implementation of Mitigation Measure 3.16-2a (Fire Safety), Mitigation Measure 3.16-2b (Nacelle Fire Risk Reduction), and Mitigation Measure 3.16-2c (Emergency Response Plan), would reduce the potential for the Project to result in the uncontrolled spread of wildfire and, therefore, would reduce the potential for landslides as a result of post-fire conditions to a less-than-significant level.

> **Mitigation Measure 3.16-4:** Implement the Fire Safety measures that would be required by Mitigation Measure 3.16-2a; implement the Nacelle Fire Risk Reduction measures that would be required by Mitigation Measure 3.16-2b; and implement the Emergency Response Plan that would be required by Mitigation Measure 3.16-2c.
>
> **Significance after Mitigation:** With implementation of these measures, the risk of flooding, mudslides, and slope instability associated with post-fire conditions would be addressed with a detailed Fire Prevention Plan, fire risk reduction measures in turbines, and an emergency response plan. Therefore, this impact would be less than significant.

3.16.3.2 PG&E Interconnection Infrastructure

Minor modifications or upgrades to the existing 230 kV line may be required to facilitate the Project's interconnection. Upgrades to PG&E facilities are anticipated to include construction and/or reconfiguration of utility line structures and transmission line circuits involving four to six new transmission poles. If required, these new poles would be constructed adjacent to the proposed substation and switching station. The modifications to the PG&E infrastructure would primarily include updating existing infrastructure. These upgrades would likely replace existing equipment with new equipment; this upgrade could slightly reduce the risk of equipment failure. However, the reconfiguration of a transmission line circuit and addition of transmission circuit and poles could result in an increase in fire risk associated with the construction of the modifications and associated transmission line failures resulting in sparks such as downed lines, bird strikes, vegetation contact, arc flashes, and equipment failure. Therefore, the modifications to the PG&E interconnection facilities could increase the risk of wildfire due to the increased risk of ignition during construction and operation of the infrastructure.

Given the inherent potential for ignition risk associated with power lines, it is anticipated that PG&E's Fire Prevention Plan would be applied to the PG&E interconnection facilities, as required by CPUC GO 166. The implementation of operational risk management programs identified in PG&E's Fire Prevention Plan and Wildfire Safety Plan would reduce the risk of an ignition during operation. Relevant programs include enhanced weather monitoring, Utility Standard S1464, the Wood Pole Test and Treat Program, Pro-Active Responses to Fire Incidents, enhancements to PG&E's Storm Outage Prediction Model, the Wildfire Reclosing Disable Program, and the implementation of the PSPS program (PG&E, 2018). Additionally, vegetation along the 230 kV PG&E line would be managed in compliance with NERC Standard FAC-003, Transmission Vegetation Management. The Project also would also be subject to the CPUC vegetation management and clearance requirements (GO 95, GO 165, and GO 166) as well as the portions of the Public Resources Code that identify clearance requirements and requirements for work in SRAs. Compliance with the above operational and vegetation clearance requirements would effectively manage the risk of exposing surrounding communities to exacerbated risk of the uncontrolled spread of a wildfire during construction and operation of the PG&E infrastructure.

Mitigation Measure 3.16-1a (implementation of the Traffic Management Plan described in Mitigation Measure 3.14-3) may be required specific to the PG&E interconnection infrastructure if oversized loads are required for delivery of PG&E equipment which loads could substantially impair emergency ingress or egress. Mitigation Measure 3.16-2b (Nacelle Fire Risk Reduction) would not be required, because the potential impact it would address would be specific to the wind turbines. Mitigation Measure 3.16-2a (Fire Safety) and Mitigation Measure 3.16-2c (Emergency Response Plan) would be required for the PG&E infrastructure to reduce a potential significant impact related to exacerbation of wildfire risks associated with the use of vehicles and equipment during construction, operation, and maintenance of the infrastructure.

3.16.3.3 Direct and Indirect Effects of Alternatives

Alternative 1: South of SR 299

Under Alternative 1, the seven turbines proposed north of SR 299 and approximately 1.5 miles of overhead transmission line would not be constructed, and the 378 acres north of SR 299 would continue to be managed for timber production. Under this alternative, the footprint of construction would be reduced, thereby slightly reducing the potential for a construction- or decommissioning-related ignition. Additionally, the reduction of turbines and associated electrical infrastructure during operation would slightly decrease the potential for an ignition during operation.

However, the overall the risk of wildland fire introduced by Alternative 1 would be substantially similar to the risk introduced by the Project. Keeping the northern part of the Project Site under timber production also may decrease the risk of wildland fire slightly as that portion of the Project Site would be harvested and thinned, preventing excessive fuel build up in the area of the Project Site north of SR 299. While Alternative 1 would reduce the risk of wildland fire slightly when compared to the Project, impact conclusions and mitigation requirements would be the same as for the Project.

Alternative 2: Increased Setbacks

Under the Alternative 2, four fewer turbines would be constructed. This reduction in the number of turbines would be slightly reduced relative to the Project's impacts to wildland fires slightly. Additionally, increasing the setbacks of the turbines from residential properties would provide some additional protection to surrounding communities by increasing the area between residences and the turbines in the event that a turbine fire were to occur. Although Alternative 2 would reduce impacts to wildland fire slightly, impact conclusions and mitigation requirements would be the same as for the Project.

No Project Alternative

If the No Project Alternative is implemented, none of the proposed wind turbines or associated transformers, meteorological towers or other infrastructure, facilities, or structures would be constructed, operated and maintained, or decommissioned on the Project Site. The proposed overhead and underground electrical collector system and communications lines would not be developed; and the onsite collector substation, switching station, and O&M facility would not be constructed. Laydown areas would not be cleared, no new access roads would be constructed, and no existing roads would be improved. No blasting or welding would occur. Project-related trucks and other delivery vehicles, cranes and other equipment, and worker vehicles would not be present on the Project Site. The Project Site would continue to be operated as managed forest timberlands. Because there would be no change relative to baseline conditions, the No Project Alternative would create no impact related to Wildfire.

The Project Site is zoned for timber production. Pursuant to regulations implementing the California Timberland Productivity Act (Government Code §51100 et seq.; 14 Cal. Code Regs. §897[a]), there is a legal presumption that "timber harvesting is expected to and will occur on

such lands." The regulations further specify that timber harvesting on such lands "shall not be presumed to have a Significant Adverse Impact on the Environment" (14 Cal. Code Regs. §898). Therefore, the No Project Alternative, including anticipated timber harvesting, is not presumed to result in a significant adverse individual or cumulative effects. CAL FIRE would review any future timber harvesting proposal to evaluate any potential project-specific, site-specific environmental impacts.

3.16.4 Cumulative Analysis

Depending on the pathway of migration for a wildfire, the geographic scope for cumulative effects related to wildfires would be the air basin, watershed boundary, or extent of adjacent wildlands. Cumulative wildfire hazards could arise at any point during Project site preparation and construction, O&M, or decommissioning.

Potential cumulative projects (including those identified in Section 3.1.2.1, *Cumulative Scenario*) could involve fire ignition causes (such as smoking, vehicle or equipment use, campfires, or electrical power) that could contribute to a cumulative risk of wildfire in the area. Specifically, ongoing impacts of the Hatchet Ridge Wind Project and of past fires would combine with the incremental impacts of the Project, mining projects, and nearby timber harvesting to contribute to the existing cumulative impacts related to wildland fire. One of the cumulative projects (project #10, Landvest Helicopter Dip Tank Installation, in Table 3.1-5, *Other Potentially Cumulative Projects within Shasta County*) would increase fire suppression readiness in the general area by installing helicopter dip tanks to aid in fire suppression. One dip tank currently is proposed within the Project Site where shown in Figure 3.16-1, *CAL FIRE Fire Hazard Severity Zones*. Two other dip tanks are proposed to be installed approximately 20 miles north of the Project Site, west of the community of Pondosa and southeast of the community of Bartle.

The Project would result in a less-than-significant impact regarding the interference with adopted emergency response or evacuation plans. Although the Project would not accommodate occupants, it is located near existing communities. Therefore, the Project has the potential to expose these communities to wildfire risks. As noted in Section 3.16.3, *Direct and Indirect Effects*, the Project Site is located in a very high fire hazard severity zones as well as Tier 2 and Tier 3 CPUC Fire Threat Districts. To ensure that potentially significant wildland fire impacts are reduced to a less-than-significant level during construction, operation, and decommissioning, Mitigation Measure 3.16-2a (Fire Safety), Mitigation Measure 3.16-2b (Nacelle Fire Risk Reduction), and Mitigation Measure 3.16-2c (Emergency Response Plan) would be implemented.

A very large part of Shasta County has been designated as being within a very high fire hazard severity zone (CAL FIRE, 2007, 2009). Since 2000, Shasta County has been subject to a number of large, severe fire events, such as the Carr Fire, Delta Fire, and Hirz Fire (2018). Given the vulnerability of the county to large severe fires, and the presence of other projects near the Project Site that also could be sources of ignition, a significant cumulative impact exists with regard to wildfire.

Section 2.5.3, *Pre-Construction Preparation*, notes that the Project includes access roads and vegetation clearance provisions. The Project would be required to comply with state and federal requirements related to vegetation clearance and fire prevention measures. Additionally, the implementation of Mitigation Measure 3.16-2a (Fire Safety) would ensure that a detailed construction and operation fire prevention plan exists. Mitigation Measure 3.16-2b (Nacelle Fire Risk Reduction) requires that turbines be equipped with fire detection and prevention technology compatible with the manufacturer's operating requirements and will be maintained in good working order. Mitigation Measure 3.16-2c (Emergency Response Plan) requires the development of an emergency response plan in coordination with CAL FIRE. These mitigation measures would reduce Project-specific impacts to a less-than-significant level. With the access roads, vegetation clearance provisions, emergency suppression equipment, etc., that would be incorporated into the Project, its incremental impact would not be cumulatively considerable because the risk of Project-related wildfire ignition would be substantially reduced and ignitions that may occur on the Project Site or due to Project-related vehicle access would be suppressed quickly.

Also as noted in Section 3.16.3, the Project would not include any housing or structures and so would not expose people or structures to any increased level or risk associated with flooding, landslides, or post-fire slope instability. The analysis also notes that the Project would not result in changes to drainage patterns. Additionally, as mitigated, the Project would reduce the risk of the spread of fire to near baseline conditions. Therefore, the potential for post-fire flooding or landslides would be less than significant. Based on this, the Project's incremental less-than-significant impact would not cause or contribute to a significant cumulative impact related to these considerations.

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CHAPTER 4
Comparison of Alternatives

This section compares the environmental advantages and disadvantages of the Project and alternatives evaluated in detail in this Draft EIR. This comparison is based on the analysis of environmental impacts of the Project provided in Chapter 3, *Environmental Analysis*, and the descriptions of the Project and alternatives provided in Chapter 2, *Description of Project and Alternatives*. This comparison is designed to satisfy the requirements of CEQA Guidelines §15126.6(d), which states:

> *The EIR shall include sufficient information about each alternative to allow meaningful evaluation, analysis, and comparison with the proposed project. A matrix displaying the major characteristics and significant environmental effects of each alternative may be used to summarize the comparison. If an alternative would cause one or more significant effects in addition to those that would be caused by the project as proposed, the significant effects of the alternative shall be discussed, but in less detail than the significant effects of the project as proposed.*

4.1 Comparison Methodology

The following methodology was used to compare alternatives in this Draft EIR:

Step 1: Identification of Alternatives. The alternatives development and screening process described in Section 2.5.1, *Alternatives Development and Screening*, was used to identify potential alternatives to the Project. Among the many potential alternatives initially considered, the No Project Alternative (described in Section 2.5.3.1); Alternative 1, South of SR 299 (described in Section 2.5.3.2); and Alternative 2, Increased Setbacks (described in Section 2.5.3.3), were carried forward for detailed environmental review. No other reasonable feasible alternatives meeting most of the basic objectives of the Project were identified that would substantially reduce or eliminate the potentially significant environmental impacts of the Project.

Step 2: Determination of Environmental Impacts. Potential environmental impacts of the Project and each of the alternatives were identified and analyzed in detail in Chapter 3, including potential direct, indirect, and cumulative impacts related to construction, operation and maintenance, and decommissioning and site restoration.

Step 3: Comparison of Project with Alternatives. Environmental impacts of the Project were compared to those of the No Project Alternative, Alternative 1, and Alternative 2 to make a preliminary determination of the Environmentally Superior Alternative.

4.2 Comparison of Alternatives

If the No Project Alternative were selected, none of the proposed wind turbines and associated facilities or infrastructure would be constructed, operated and maintained, or decommissioned on the Project Site. No Federal Aviation Administration–approved lighting would be present; none of the proposed ground clearance or subsurface disturbance would occur; and no electrical or communications lines would be installed on the Project Site. No new access roads would be constructed, existing culverts would not be improved. The Project Site would continue to be operated as managed forest timberlands subject to authorizations of California Department of Forestry and Fire Protection, the Regional Water Quality Control Board, and other regulatory agencies.

Because the No Project Alternative would avoid all potential impacts of the Project and Alternatives 1 and 2, the No Project Alternative is not included in **Table 4-1**, *Summary of Impacts of the Project and Alternatives*. For Alternatives 1 and 2, Table 4-1 provides a comparative analysis for each of the resource areas and concludes whether the Alternatives would cause impacts that would be substantially the same as, or increased or reduced relative to the Project.

4.3 Environmentally Superior Alternative

The CEQA Guidelines define the environmentally superior alternative as that alternative with the least adverse impacts to the project area and its surrounding environment. The No Project Alternative is considered the environmentally superior alternative for CEQA purposes because it would avoid all impacts of the Project. However, the No Project Alternative would fail to meet the basic objectives of the Project, including but not limited to: locating a commercially financeable wind energy project with the capacity to provide up to 216 megawatts to the Northern California grid (NP15) in close proximity to an existing Pacific Gas and Electric Company transmission line (see Section 2.3, *Project Objectives*).

Because the environmentally superior alternative is the No Project Alternative, the EIR also must identify an environmentally superior alternative from among the other alternatives.

Determining an environmentally superior alternative can be difficult because of the many factors that must be balanced. For example, Alternative 2 could be preferred because, relative to the Project, it would further remove wind project infrastructure from residential property lines and from all roads, not just public ones. Slightly fewer roads and less below-ground and above-ground infrastructure would be constructed, operated and maintained, and decommissioned and removed from the Project Site. Similarly, the Project could be preferred because, relative to either Alternative 1 or Alternative 2, it would generate the greatest amount of renewable energy, and thus would offset the most metric tons of carbon dioxide emissions generated by fossil fuels and provide greater assistance to the State toward meeting the renewable energy generation targets set in Senate Bill 100.

Additional information received in or developed during the agency and public review period for the Draft EIR, or during the project approval process, could affect the balancing of the respective benefits and consequences of the alternatives. Accordingly, it would be premature to designate an Environmentally Superior Alternative at this stage.

TABLE 4-1
SUMMARY OF IMPACTS OF THE PROJECT AND ALTERNATIVES

EIR Section	Resource Area	Project	Alternative 1, South of SR 299	Alternative 2, Increased Setbacks
3.2	Aesthetics	Impact 3.2-1: The Project, in particular the form, color, movement, and nighttime lighting of the proposed turbines, would have a substantial adverse effect by substantially reducing visual character, visual quality, and the quality of scenic vistas for tourists, recreationists, or residents. While the implementation of recommended Mitigation Measure 3.2-1 would reduce the potential significance of impacts, impacts would not be reduced below established thresholds of significance (Significant and Unavoidable). The Project would result in a less than significant impact relating not only to the potential to damage to scenic resources within a state scenic highway (Impact 3.2-2), but also to the potential to create a new source of substantial light or glare that would adversely affect daytime or nighttime views in the area (Impact 3.2-3). (Less than Significant Impact)	Under Alternative 1, the up-to-seven turbines north of SR 99 (turbine numbers A01 through A07) would not be constructed, resulting in incrementally fewer obstructions in the visual landscape and incrementally fewer safety lights. Depending on the specific viewing location, this alternative could reduce aesthetic impacts; however, from certain locations, clustering of turbines south of SR 299 could reduce the coherence between the Hatchet Ridge project and the proposed Project, creating an appearance of multiple separate wind energy generation projects encroaching in the foothills. Any increase or decrease in the aesthetic impacts created by Alternative 1 would not be significant. Therefore, depending on the viewing location, Alternative 1 could either slightly increase or reduce aesthetic impacts. Impacts would be substantially similar to the Project impact conclusions and mitigation requirements would remain the same. **Equal to the Project**	Under Alternative 2, proposed setbacks would be increased relative to the Project to preclude turbine construction within three times the height of the turbine (i.e., within 2,037 feet) of a residential property line and within 1.5 times the height of the turbine (i.e., within 1,018.5 feet) of State Route 299, any other publicly-maintained public highway or street, and of two private roads (Supan Road and Terry Mill Road). This would result in four of the Project turbines (M03, D05, B01 and K02) not being constructed. The resulting spacing of the turbine strings could reduce from key observation points 1, 2, and 3 the visibility and visual impact of turbines from SR 299 and regarding views from KOPs near SR 299. Although this alternative would reduce the overall visual impact of the wind energy development compared to the Project, impact conclusions and mitigation requirements would remain the same. **Less than the Project**
3.3	Air Quality	Impact 3.3-2c: Construction, decommissioning, and site reclamation activities would generate PM_{10} emissions that would result in a cumulatively considerable net increase of PM_{10}, for which the Project region is non-attainment of California Ambient Air Quality Standards (CAAQS). The implementation of recommended Mitigation Measure 3.3-2c would reduce the severity of the impact, but not below established threshold of significance. (Significant and Unavoidable) Impact 3.3-1, Impact 3.3-2b: Construction, decommissioning, and site reclamation activities would generate NO_x and other emissions that could obstruct implementation of the Northern Sacramento Valley Planning Area 2018 Plan to attain the ozone CAAQS by resulting in a violation of an ozone air quality standard, and thereby would be inconsistent with the intent of the 2018 Plan and result in a cumulatively considerable net increase in regional ozone emissions. The implementation of recommended Mitigation Measures 3.3-1a and 3.3-1b would reduce the potential significance of these impacts below established thresholds. (Less than Significant with Mitigation Incorporated) The Project would result in various less than significant impacts, including with respect to its construction, decommissioning, and site reclamation activities and the generation of ROG emissions that could result in a cumulatively considerable net increase of ozone (Impact 3.3-2a); its operation, which would generate pollutant emissions that would not result in a cumulatively considerable net increase of criteria pollutants (Impact 3.3-2d and 3.3-3); its emission of Toxic Air Contaminants (Impact 3.3-4); and its potential to create objectionable odors (Impact 3.3-5). (Less than Significant Impact)	Under Alternative 1, construction activities, including timber harvesting, would generate fewer vehicle trip and equipment emissions than the number estimated for the Project because up-to-seven fewer turbines and related infrastructure would be constructed. Similarly, the decommissioning and site reclamation phase also would generate fewer vehicle trip and equipment emissions than the amounts estimated for the Project because fewer turbines and related infrastructure would be developed and the size of the area to be reclaimed would be smaller than what was identified for the Project. Although the impacts would be reduced relative to the Project, the impact conclusions and mitigation requirements would remain the same. **Less than the Project**	Under Alternative 2, construction activities, including timber harvesting, would generate fewer vehicle trip and equipment emissions than the number estimated for the Project because up-to-four fewer turbines and related infrastructure would be constructed. Similarly, the decommissioning and site reclamation phase would generate fewer vehicle trip and equipment emissions than the amounts estimated for the Project because fewer turbines and related infrastructure would be developed and the size of the area to be reclaimed would be smaller than for the Project. Although the impacts would be reduced relative to the Project, the impact conclusions and mitigation requirements would remain the same. **Less than the Project**
3.4	Biological Resources	Operation of the Project would result in significant unavoidable Project-specific and cumulative impacts -potentially including mortality and injury- to eagles and other raptors (including goshawk) as well as to bats, including special-status bat species, via collision with power lines or operating wind turbine generators, or electrocution from energized components. See Impact 3.4-3, Impact 3.4-8, Impact 3.4-13, and Impact 3.4-18. Mitigation measures including monitoring and potential adaptive operational techniques are identified at the Project-specific level; however, even with mitigation incorporated, remaining impacts would be Significant and Unavoidable. Because no additional reasonable, feasible mitigation measures are available to address cumulative impacts that, if implemented, would reduce the Project's contribution below the established level of significance. Therefore, cumulative impacts would remain Significant and Unavoidable. Mitigation measures have been identified, the implementation of which would reduce other Project impacts below established thresholds. This is true with respect to: Impact 3.4-1 (potential construction impacts to special- status plant species within an unsurveyed 800-acre area of the Project Site), Impact 3.4-2 (construction impacts on nesting bald and golden eagles –although the likelihood of eagles nesting within the Project Site is low, construction noise and activity could result in nesting disruption or abandonment if activities occur during the nesting season and active nests are located in the vicinity), Impact 3.4-4 (decommissioning impacts to nesting bald and golden eagles similar to those described for the construction in Impact 3.4-3), Impact 3.4-6 (construction and decommissioning impacts to nesting raptors other than goshawks due to noise, vegetation removal, and increased activities during the construction and decommissioning), Impact 3.4-7 (construction and decommissioning impacts to nesting goshawks due to noise, vegetation removal, and increased activities	Under Alternative 1, the Project Site would be 4,086 acres resulting in 378 acres of less Project-related disturbance and seven (9.7 percent) fewer turbines than the Project. This would result in a similar percentage reduction in bird and bat collision-related impacts. Collisions resulting in eagle, other sensitive raptors, and bats would continue to be significant and unavoidable, but likely reduced by approximately 10 percent compared to the Project. Alternative 1 would require less Rocky Mountain Maple Riparian Scrub (a sensitive vegetation community) habitat removal. An estimated 31.3 fewer acres of this habitat would be removed, resulting in a 27 percent reduction in the impact area. As for the Project, the impacts related to removal of this habitat would be less than significant with mitigation incorporated. In other respects, Alternative 1 would reduce impacts relative to the Project generally commensurate with the reduction in disturbance and number of turbines. Although the impacts would be reduced relative to the Project, the impact conclusions and mitigation requirements would remain the same. **Less than the Project**	Alternative 2 is anticipated to result in 102 fewer acres of temporary disturbance and 49 fewer acres of permanent disturbance than the Project. Alternative 2 also would result in the construction and operation of four (5.5 percent) fewer turbines than the Project. This would result in a similar percentage reduction in bird and bat collision related impacts. Collisions resulting in eagle, other sensitive raptors, and bats would continue to be significant and unavoidable, but likely reduced by approximately 5.5 percent compared to the Project. Alternative 2 would require approximately 1.7 acres less removal of Rocky Mountain Maple Riparian Scrub habitat. As for the Project, the impacts related to removal of this habitat would be less than significant with mitigation incorporated. In other respects, Alternative 2 reduce impacts relative to the Project generally commensurate with the reduction in disturbance. Although the impacts would be reduced relative to the Project, the impact conclusions and mitigation requirements would remain the same. **Less than the Project**

TABLE 4-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROJECT AND ALTERNATIVES

EIR Section	Resource Area	Project	Alternative 1, South of SR 299	Alternative 2, Increased Setbacks
3.4 (cont.)	Biological Resources	during the construction and decommissioning), Impact 3.4-12 (habitat loss and water quality impacts on Pit roach, special-status amphibians and western pond turtle), Impact 3.4-15 (Project impacts to riparian habitat or other sensitive vegetation communities, including removal of up to 107.2 acres of sensitive Rocky Mountain Maple Riparian Scrub habitat), and Impact 3.4-16 (Project impacts to wetlands and other waters, including permanent impacts on 2.22 acres of wetlands and 1.2 acres of other waters; temporary impacts on 1.48 acres of wetlands and 0.6 acres of other waters; and impacts resulting from the construction of or improvement to 32 stream crossings, including crossings of perennial, ephemeral, intermittent and unvegetated ditch type streams. In other respects, Project impacts would be less than significant, and no mitigation measures would be required. This is true with respect to Impact 3.4-5 (Project impacts to California spotted owls – although California spotted owl use of the area is expected to be low based on Project Site surveys and the results of Hatchet Ridge Wind post construction monitoring efforts, 995 acres of the Project Site was identified as being suitable [moderate or high quality] habitat for California spotted owls and potential nesting disruption could result from project noise, vegetation clearing, and increased activities during the construction and decommissioning phases), Impact 3.4-9 (collision-related impacts to waterfowl during operation), Impact 3.4-10 (Project impacts on sandhill cranes during migratory movements in fall and spring), Impact 3.4-11 (construction and decommissioning impacts to nesting songbirds, potentially including special-status species). Impact 3.4-14 (temporary adverse impacts to special-status mammals during site preparation and construction, and during decommissioning and site restoration activities), and Impact 3.4-17 (impacts to movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites).		
3.5	Communications Interference	The Project could cause intermittent interference to or freezing of television reception at some residences in the service area of the stations that broadcast over the Project Site (Impact 3.5-1) and or interference with point-to-point microwave relay station transmissions due to turbine location adjustments or currently unknown transmissions. The implementation of recommended Mitigation Measures 3.5-1 and 3.5-3 would reduce the potential significance of these impacts below established thresholds. (Less than Significant with Mitigation Incorporated) The Project also would result in a less-than-significant impact related to potential interfere with existing navigational systems operated by the FAA or the U.S. military (Impact 3.5-2). (Less than Significant Impact)	All of the turbine locations under Alternative 1 would be at least as far away from land mobile/public safety radio transmitter stations, earth satellite stations, AM broadcast facilities, television broadcast facilities, aircraft navigation beacons, and microwave and cellular communication facilities as for the Project. Therefore, the potential impacts on television reception (Impact 3.5-1), aircraft navigation (Impact 3.5-2), and microwave and cellular communication (Impact 3.5-3) would be the same as described for the Project. It is possible that Alternative 1 could slightly reduce the potential for unforeseen microwave communication interference because the turbines north of SR 299 would not be constructed (turbines A01, A02, and A03 are some of the closest to known microwave paths, as identified in Appendix D; however, evaluation of these turbines did not indicate interfere with the Fresnel zones of these paths, and so these turbines are not expected to cause interference. Therefore, the impact conclusions and mitigation requirements would be the same as for the Project. **Equal to the Project**	All of the turbine locations Under Alternative 2 would be at least as far away from land mobile/public safety radio transmitter stations, earth satellite stations, AM broadcast facilities, television broadcast facilities, aircraft navigation beacons, and microwave and cellular communication facilities as described for the Project. Therefore, the potential impacts on television reception (Impact 3.5-1), aircraft navigation (Impact 3.5-2), and microwave and cellular communication (Impact 3.5-3) would be the same as described for the Project, although there may be a small reduction in the potential for unforeseen microwave communication interference because several turbines would not be constructed (turbine D05 is one of the closest to known microwave paths, as identified in Appendix D; however, evaluation of this turbine did not indicate that it would interfere with the Fresnel zones of these paths and so is not expected to cause interference). Therefore, the impact conclusions and mitigation requirements would be the same as for the Project. **Equal to the Project**
3.6	Cultural and Tribal Cultural Resources	Impact 3.6-3: There is a prehistoric archaeological site in the Project Site that, for the purposes of CEQA, is considered a tribal cultural resource. In addition, Native American tribes have identified tribal cultural resources in the Project Site. The Project would cause a substantial adverse change in the significance of a tribal cultural resource if such a resource were disturbed or damaged. The implementation of recommended Mitigation Measures 3.6-1 and 3.6-3 would reduce the severity of the impact, but not below established thresholds (Significant and Unavoidable) Impact 3.6-1: The Project could cause a substantial adverse change pursuant to CEQA Guidelines Section 15064.5 due to disturbance of a historical resource, for example, during grading and excavation associated with construction, trenching, or the soil borings that would be collected to an approximately 50-foot depth to ensure that the proposed turbine foundations would be stable. The implementation of recommended Mitigation Measure 3.6-1 would reduce the potential significance below established thresholds. (Less than Significant with Mitigation Incorporated) Impact 3.6-2: Given the prehistoric archaeological sensitivity of the Project Site, the possibility of encountering human remains cannot be discounted. Project-related disturbance of human remains would be a significant impact and could occur if, for example, grading, excavation, or soil borings associated with construction of facilities and infrastructure. The implementation of recommended Mitigation Measure 3.6-2 would reduce the potential significance below established thresholds. (Less than Significant with Mitigation Incorporated).	Under Alternative 1, no turbines would be erected north of SR 299. Thus, Alternative 1 would avoid all impacts to cultural and tribal cultural resources north of SR 299, if any such resources exist. There would be an overall reduced acreage of temporary and permanent disturbance, limited to a footprint defined in a smaller area with fewer turbines compared to the Project. The prehistoric archaeological site in the Project Site would not be avoided. Although impacts would be reduced relative to the Project, the impact conclusions and mitigation requirements would remain the same. **Less than the Project**	Under Alternative 2, the prehistoric archaeological site identified within the Project Site would not be avoided; however, the overall reduction in the number of turbines would reduce both temporary (construction-related) and permanent disturbance compared to the Project. Alternative 2 would require implementation of the same protective measures and mitigation as the Project. Although impacts would be reduced relative to the Project, impact conclusions and mitigation requirements would remain the same under Alternative 2. **Less than the Project**

TABLE 4-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROJECT AND ALTERNATIVES

EIR Section	Resource Area	Project	Alternative 1, South of SR 299	Alternative 2, Increased Setbacks
3.7	Energy	Impact 3.7-1: Project construction, operation and maintenance, decommissioning and site reclamation could result in the wasteful, inefficient, or unnecessary consumption or use of energy associated with equipment and vehicle fuel use, although there are no unusual Project characteristics that would cause the such use to be less energy-efficient compared with other similar projects elsewhere in the state. The Project's use of electricity during operation and maintenance would be greatly offset by the generation of electricity from the Project. Accordingly, the Project's electricity demand also would not constitute a wasteful, inefficient, or unnecessary use of energy. (Less than Significant Impact) The Project would provide a new source of renewable energy supporting SB 100 and the State's energy goals, and would result in a substantial beneficial impact relating to renewable energy generation, the use of which to serve demand would be prioritized over gas-fired plants and non-renewable sources. (Beneficial Effect)	Under Alternative 1, incrementally less fuel would be required to construct, operate, maintain, and decommission a wind energy development on the Project Site because up-to-seven fewer turbines and related infrastructure would be developed. Alternative 1 would have a total nameplate generating capacity of up to 195 MW, which equates to approximately 21 MW less nameplate generating capacity as the Project. This output would more than offset the amount of electricity needed to operate and maintain Alternative 1, but would not result in as substantial a benefit as the Project due to the reduced overall capacity. Although the impacts and overall benefit of Alternative 1 would be reduced relative to the Project, the impact conclusion would remain the same, and no mitigation measures would be required. **Greater than the Project**	Alternative 2 would preclude the construction of four wind turbines, as compared to the Project, resulting in the loss of approximately 12 MW to 22.8 MW of generating capacity based on generation potential per turbine. Under Alternative 2, the number of workers and durations of construction, operation and maintenance, and decommissioning and site restoration would be incrementally less than for the Project, resulting in slightly reduced fuel use. Electricity needed during operation and maintenance would more than offset the amount of electricity needed to operate and maintain Alternative 2, but would not result in as substantial a benefit as the Project due to the reduced overall capacity. Although the impacts and overall benefit of Alternative 2 would be reduced relative to the Project, the impact conclusions would remain the same, and no mitigation measures would be required. **Greater than the Project**
3.8	Forest Resources	Impact 3.3-1: The Project would result in the temporary disturbance of up to 1,384 acres of timberland during construction and the permanent conversion of up to 713 acres of timberland to developed power generation facilities uses (i.e., to the loss of forest land or conversion of forest land to non-forest use). This would result in a reduction of less than 0.05 percent of the commercial forest lands in Shasta County. (Less than Significant Impact)	Alternative 1 would adversely affect incrementally less timberland than the Project because the approximately 378 acres of the Project Site located north of SR 299 would continue to be managed for timber production. This elimination of 378 acres of the Project Site from development would reduce temporary impacts to commercial forest lands from 1,384 acres to 1,259 acres and would reduce permanent impacts from 713 acres to 652.5 acres. Although the impacts of Alternative 1 would be slightly reduced relative to the Project, the impact conclusion would remain the same, and no mitigation measures would be required. **Less than the Project**	Alternative 2 would reduce temporary impacts to commercial forest lands from 1,384 acres to 1,282 acres relative to the Project and would reduce permanent impacts from 713 acres to 664 acres. Although the impacts of Alternative 2 would be slightly reduced relative to the Project, the impact conclusion would remain the same, and no mitigation measures would be required. **Less than the Project**
3.9	Geology and Soils	The Project would cause less-than-significant impacts to geology, soils and paleontological resources, including the risk of loss, injury, or death involving strong seismic ground shaking (Impact 3.9-1), seismic-related ground failure (including liquefaction) (Impact 3.9-2), and landslides (Impact 3.9-3). It also would result in less-than-significant impacts resulting in substantial soil erosion or the loss of topsoil (Impact 3.9-4) or unstable geologic units or soils that potentially could result in on- or off-site landslide, lateral spreading, subsidence, liquefaction or collapse (Impact 3.9-5). Further, the Project would cause less-than-significant impacts relating to the creation of substantial direct or indirect risks to life or property due to its location on expansive or corrosive soil (Impact 3.9-6) and the adequacy of onsite soils to support the proposed septic tank (Impact 3.9-7). (Less than Significant Impact)	Alternative 1 would result in an incremental reduction in soil disturbance (and erosion potential) relative to the Project due to the fact that up-to-seven fewer turbines and related infrastructure would be developed, and fewer onsite road miles would be needed to develop and serve Alternative 1. A septic system would be developed just as for the Project. Although the impacts of Alternative 1 would be slightly reduced relative to the Project, the impact conclusions would remain the same, and no mitigation measures would be required. **Less than the Project**	Alternative 2 would result in an incremental reduction in soil disturbance (and erosion potential) relative to the Project due to the fact that four fewer turbines and related infrastructure would be developed, and fewer onsite road miles would be needed to develop and serve Alternative 2. A septic system would be developed just as for the Project. Although the impacts of Alternative 2 would be slightly reduced relative to the Project, the impact conclusions would remain the same, and no mitigation measures would be required. **Less than the Project**
3.10	Greenhouse Gas Emissions	The Project also would have a less than significant impact relating to its potential to conflict with an applicable plan, policy, or regulation adopted for the purpose of reducing GHG emissions. The Project would directly support the 40 percent reduction in GHG emissions by 2030 target under the 2017 Scoping Plan Update and goal of SB 100 for increasing California's procurement of electricity from renewable sources to 100 percent by 2045; Executive Order B-55-18 and the new statewide goal of achieving carbon neutrality (zero-net GHG emissions) by 2045 and maintaining net negative emissions thereafter; the 2018 Regional Transportation Plan & Sustainable Communities Strategy for the Shasta Region; and the Forest Carbon Plan. (Impact 3.10-2). The Project would result in a less-than-significant impact relating to the generation, directly and indirectly, of GHG emissions such as CO_2, methane, nitrous oxide and SF_6. After accounting for the annualized construction and decommissioning, and annual operational emissions of 809 MT CO2e per year, and the loss of carbon sequestration capacity during the Project's operational timeframe, the Project would provide a potential reduction of 225,131 MT CO2e per year. Overall, this would be a beneficial impact. (Impact 3.10-1)	Alternative 1 would generate incrementally fewer GHG emissions than the Project and would offset incrementally fewer MT CO2e per year because it would have a total nameplate generating capacity that would be approximately 21 MW less than the Project due to the reduction in the number of turbines. There would be no change relative to the Project with respect to plan consistency. The impacts of Alternative 1 would be slightly reduced relative to the Project; the beneficial effect of Alternative 1 also would be reduced. Nonetheless, the impact conclusions would remain the same, and no mitigation measures would be required. **Greater than the Project**	Alternative 2 would generate incrementally fewer GHG emissions than the Project and would offset incrementally fewer MT CO2e per year because it would have a total nameplate generating capacity that would be 12 to 22.8 MW less than the Project due to the reduction in the number of turbines. There would be no change relative to the Project with respect to plan consistency. The impacts of Alternative 2 would be slightly reduced relative to the Project; the beneficial effect of Alternative 2 also would be reduced. Nonetheless, the impact conclusions would remain the same, and no mitigation measures would be required. **Greater than the Project**

TABLE 4-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROJECT AND ALTERNATIVES

EIR Section	Resource Area	Project	Alternative 1, South of SR 299	Alternative 2, Increased Setbacks
3.11	Hazards and Hazardous Materials	During normal operation, equipment failure or an extreme event could lead to turbine failure, resulting in a potential hazard (Impact 3.11-3). The Project also could impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan (Impact 3.11-7). The implementation of recommended Mitigation Measure 3.11-3 and Mitigation Measure 3.11-7, respectively, would reduce the potential significance of each impact below established thresholds. (Less than Significant with Mitigation Incorporated) The Project would have a less-than-significant impact from the potential to create a significant hazard to the public or environment through the routine transport, use, or disposal of hazardous materials or wastes (Impact 3.11-1), reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment (Impact 3.11-2), potential hazards from ice shed from turbine blades (Impact 3.11-4), applications of certain pesticides (Impact 3.11-5), and from the alternating changes in light intensity that could occur when turbine blades are rotating (Impact 3.11-6).	Alternative 1 would result in substantially the same impact as the Project relating to equipment or turbine failure and to potential impairment of or interference with an evacuation plan. the same mitigation requirements would apply. Alternative 1 would result in incremental reductions in the less-than-significant impacts that would be caused by the Project due to the up-to-seven fewer turbines that would be constructed, operated and ultimately decommissioned. As a result, Alternative 1 would cause an incremental reduction in the amount of hazardous materials or waste, incrementally fewer turbine blades that could shed ice, and incrementally less vegetation that would be subject to pesticide application. The turbines that would be installed under Alternative 1 would cause substantially the same shadow flicker as the Project in light of the locations of potential receptors. Even with these incremental changes in impact levels, the impact conclusions would remain the same. **Less than the Project**	Alternative 2 would differ from the Project by precluding the construction, operation and maintenance of turbines within three times the height of the turbine from a residential property line and would require setbacks of 1.5 times the height of the turbine from public and private roads. Because Project turbines (M03, D05, B01 and K02 not be constructed, Alternative 2 would result in a less than significant impact relative to whether, during normal operation, equipment failure or an extreme event could lead to a turbine failure resulting in a blade throw. Under Alternative 2, Mitigation Measure 3.11-3 (Mandatory Setbacks) would not be required. Given the greater distance between proposed turbines and potential visual receptors, the less than significant impact of the Project relating to shadow flicker would be even more remote under Alternative 2. Remaining impacts would be incrementally reduced, or substantially the same as the Project. **Less than the Project**
3.12	Hydrology and Water Quality	The Project would, unless mitigated, violate water quality standards or waste discharge requirements or otherwise substantially degrade surface or groundwater quality during construction and decommissioning (Impact 3.12-1); substantially degrade groundwater quality from blasting, if it occurs (Impact 3.12-2); substantially increase siltation of waterways or provide substantial additional sources of polluted runoff during construction and decommissioning (Impact 3.12-4); and conflict with implementation of the Central Valley Basin Plan (Impact 3.12-5). The implementation of recommended mitigation measures would reduce the potential significance of each of these potential significant impacts below established thresholds. (Less than Significant with Mitigation Incorporated) The Project would result in a less-than-significant impact relating to the potential to decrease groundwater supplies or interfere with groundwater recharge such that the project may impede sustainable groundwater management of the basin (Impact 3.12-3).	Alternative 1 would avoid all impacts to Little Hatchet Creek and most disturbance-related impacts to the main stem of Hatchet Creek. There would be an overall reduction in temporary and permanent disturbance due to the fewer number of turbines compared to the Project. Although the impacts of Alternative 1 would be reduced relative to the Project, the impact conclusions would remain the same, and the same mitigation measures would be required. **Less than the Project**	Given the location of the Project turbines that would not be constructed under Alternative 2, Alternative 2 would result in substantially similar impacts to hydrology and water quality as the Project. The same impact conclusions would be reached, and the same mitigation measures would be required. **Equal to the Project**
3.13	Noise and Vibration	The Project could result in the generation of a substantial temporary increase in ambient noise levels (Impact 3.13-2) on and near the Project Site in excess of standards if construction activities were required during nighttime hours or during helicopter use. The implementation of recommended Mitigation Measure 3.13-2 would reduce the potential significance of this potential significant impact below established thresholds. The Project also could result in significant impacts due to groundborne vibration from blasting. The implementation of Mitigation Measure 3.13-3 would reduce impacts to below established thresholds. (Less than Significant with Mitigation Incorporated) The Project would have a less-than-significant impact from operational noise due to the generation of a substantial permanent increase in ambient noise levels in the vicinity of the Project (Impact 3.13-1).	Because the Project turbines that would not be constructed under Alternative 1 would be located over 5,000 feet from the nearest receptor (LT-3) and, thus, would contribute substantially less to noise and vibration impacts, the impacts of Alternative 1 would be substantially the same as those of the Project, the impact conclusions would be the same, and the same mitigation requirement would apply. **Equal to the Project**	Under Alternative 2, proposed setbacks would be increased relative to the Project to preclude turbine construction within 2,037 feet of a residential property line and within 1,018.5 feet of SR 299, any other publicly-maintained public highway or street, and of Supan Road or Terry Mill Road. Implementation of these setbacks would remove turbines M03, D05, and B01 based on the residential property line setback, and would remove turbine KO2 based on the roadway setback. The effect of eliminating these turbines, in particular turbine D05, would reduce the operational and construction-related noise levels at receptor location R-4 compared to those identified for the Project. Although this impact would be incrementally reduced relative to the Project, the impact conclusions would be the same and the same mitigation requirements would apply. **Less than the Project**
3.14	Transportation	The Project would, unless mitigated, substantially increase safety hazards to the public and inhibit emergency access due to the proposed use of oversize vehicles, which could limit motorists' views on roadways and obstruct the driving area (Impact 3.14-3, Impact 3.14-4). The implementation of recommended Mitigation Measure 3.14-3 would reduce these potential significant impacts to a less-than-significant level. (Less than Significant with Mitigation Incorporated) The Project would result in less-than-significant impacts relating to its potential to conflict with a program plan, ordinance or policy addressing the circulation system (Impact 3.14-1) and its potential to conflict or be inconsistent with CEQA Guidelines Section 15064.3(b) regarding vehicle miles traveled (VMT) as the appropriate focus of transportation analyses toward reducing related GHG emissions (Impact 3.14-2).	Alternative 1 would require incrementally fewer oversized loads to deliver/remove heavy construction equipment and wind turbine components due to the reduction by up to seven turbines relative to the Project. Further, Alternative 1 would incrementally further reduce the Project's less-than-significant VMT impact because incrementally fewer vehicle trips by pick-up trucks, haul trucks, and worker vehicles due to the possibility of an incremental reduction in construction and decommissioning schedules resulting from a need for less work to occur during those timeframes. Although the impacts of Alternative 1 would be reduced relative to the Project, the impact conclusions would remain the same and the same mitigation measure would be required. **Less than the Project**	Alternative 2 would require incrementally fewer oversized loads to deliver/remove heavy construction equipment and wind turbine components due to the reduction by four turbines relative to the Project. Further, Alternative 2 would incrementally further reduce the Project's less-than-significant VMT impact because it would require fewer vehicle trips due to the possibility of an incremental reduction in construction and decommissioning schedules resulting from a need for less work to occur during those timeframes. Although the impacts of Alternative 2 would be reduced relative to the Project, the impact conclusions would remain the same and the same mitigation measure would be required. **Less than the Project**

TABLE 4-1 (CONTINUED)
SUMMARY OF IMPACTS OF THE PROJECT AND ALTERNATIVES

EIR Section	Resource Area	Project	Alternative 1, South of SR 299	Alternative 2, Increased Setbacks
3.15	Utilities and Service Systems	The Project would have a less-than-significant impact on utilities and service systems relating to the sufficiency of water supplies available to serve the Project (Impact 3.15-1), the adequacy of a wastewater treatment provider's capacity to serve the Project's projected demand (Impact 3.15-2), and the Project's potential to generate solid waste in excess of State or local standards, or in excess of the capacity of local infrastructure, or otherwise impair the attainment of solid waste reduction goals (Impact 3.15-3). (Less than Significant Impact)	Alternative 1 would incrementally reduce water, wastewater and solid waste needs commensurate with the reduction in development and ground disturbance associated with up-to-seven fewer turbines and related infrastructure such as would be needed for the collector system, access roads, and lay-down areas relative to the Project. Storm water drainage infrastructure or improvements would not be required north of SR 299. Although the impacts of Alternative 1 would be reduced relative to the Project, the impact conclusions would remain the same. **Less than the Project**	Alternative 2 would incrementally reduce water, wastewater and solid waste needs commensurate with the reduction in development and ground disturbance associated with the development of four fewer turbines and related infrastructure. Although the impacts of Alternative 2 would be reduced relative to the Project, the impact conclusions would remain the same. **Less than the Project**
3.16	Wildfire	The Project would, unless mitigated, substantially impair an adopted emergency response plan or emergency evacuation plan (Impact 3.16-1); exacerbate wildfire risks and expose Project occupants to pollutant concentrations or a significant risk of loss, injury or death from a wildfire or the uncontrolled spread of a wildfire (Impact 3.14-2); and expose people or structures to significant risks, including downslope or downstream flooding or landslides, as a result of runoff, post-fire slope instability, or drainage changes (Impact 3.16-4). The implementation of recommended Mitigation Measure 3.16-1; Mitigation Measures 3.16-2a, 3.16-2b and 3.16-2c; and Mitigation Measure 3.16-4 would reduce these potential significant impacts to a less-than-significant level. (Less than Significant with Mitigation Incorporated) The Project also would have a less-than-significant impact resulting from the proposed installation and maintenance of infrastructure such as roads, fuel breaks, emergency water sources, power lines or other utilities because such infrastructure could exacerbate fire risk (Impact 3.16-3). (Less than Significant Impact)	Alternative 1 would incrementally reduce the construction, operations and maintenance, and decommissioning footprint, restricting it to the portion of the Project Site that is located south of SR 299. This would have the effect of incrementally reducing the potential for a wind project-related ignition during all phases of the Project. Further, under Alternative 1, the portion of the Project Site north of SR 299 would remain under timber management and production, which could decrease the risk of wildland fire because that portion of the Project Site would be harvested and thinned, preventing excessive fuel build up in the area of the Project Site north of SR 299. Although the impacts of Alternative 1 would be reduced relative to the Project, the impact conclusions would remain the same and the same mitigation requirements would apply. **Less than the Project**	Alternative 2 would reduce the number of turbines by four relative to the Project, and so would incrementally reduce potential ignition sources from turbines, vehicles and equipment during construction, operation and decommissioning relative to the Project. Additionally, increasing the setbacks of the turbines from residential properties would provide some additional protection to surrounding communities by increasing the area between residences and the turbines in the event that a turbine fire were to occur. Although Alternative 2 would reduce impacts to wildland fire slightly, impact conclusions would be the same and the same mitigation requirements would apply. **Less than the Project**

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CHAPTER 5
Report Preparation

5.1 Lead Agency

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	Federal Aviation Administration, U.S. Department of Transportation
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Norris, Jennifer	U.S. Fish and Wildlife Service
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	California Energy Commission, Media and Public Communications Office
	California Public Utilities Commission
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	Native American Heritage Commission
Babcock, Curt (Habitat Conservation Program Manager)	California Department of Fish and Wildlife
Hubbard, Kristin (Environmental Scientist)	California Department of Fish and Wildlife
Bradley, Mike (Region Chief)	California Department of Forestry and Fire Protection (CAL FIRE)
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Cruse, Rubin	Shasta County, County Counsel
Ross, James (Assistant County Counsel)	Shasta County, County Counsel's Office

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Tribal Entities/Members

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Natalie Forrest-Perez	Pit River Tribe, Tribal Historic Preservation Officer
	Pit River Tribe: Madesi/Atsuge/Ajumawi/Aporige
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Murphy, Barbara (Chair)	Redding Rancheria
Potter, Jack (Chairperson)	Redding Rancheria
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Hall, Roy (Chairperson)	Shasta Nation
Whitehouse, Gene (Chairperson)	United Auburn Indian Community of the Auburn Rancheria
Sisk-Franco, Caleen (Chief)	Winnemem Wintu Tribe
	Wintu Educational and Cultural Council
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